AUDIO VISUAL COMMUNICATION REVIEW

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AUTOMATION AND EDUCATION:
I. General Aspects

• JAMES D. FINN

This is the first in a series of three articles that will discuss one of the most important and timely problems that educators face today—the effects of automation upon education. James D. Finn is professor of education at the University of Southern California and educational consultant for "Teaching Tools" and "Film World" magazines.

IN THE year 1869, Thomas Henry Huxley addressed the Liverpool Philomathic Society at a dinner meeting. His subject was scientific education. During the course of his speech, he said, "As industry attains higher stages of its development, as its processes become more complicated and refined, and competition more keen, the sciences are dragged in, one by one, to take their share in the fray; and he who can best avail himself of their help is the man who will come out uppermost in that struggle for existence. . . ." (21:114)

Huxley was a mighty prophet in many ways, but never was his crystal ball more clear than that night slightly less than one hundred years ago. Over the century since he spoke, the sciences and their offspring technologies have, indeed, one-by-one and two-by-two, entered the arena of industry (and of military science) until practitioners of the most unlikely sciences can be found busy on Madison Avenue, in the General Motors Research Institute, or the Pentagon Building.

Somewhere along the line, the First Industrial Revolution—which was the product of inventors—became the Second Industrial Revolution—which is the product of scientists and technicians. We are told on all sides by competent observers that we are just beginning to reap the harvest of the Second Industrial Revolution; that we have, in fact, just entered the era; that atomic power, rocket engines, and automation, for example, are in their technological infancies.

Of all of these phenomena which have resulted from the application of science to industrial and military problems, automation is, or should be, of greatest interest to the professional educator. The problems and promises inherent in automation are directly related to education. Educators must re-examine science and technology in the second half of the Twentieth Century, keeping in mind Huxley's phrase that ". . . he who can best avail himself of their help is the man who will come out uppermost in that struggle for existence. . . ."

What is needed in 1957 and for many years to come is (a) a thorough assessment of the nature of the new technological world and its implications for education; (b) a revision of educational organization, procedures, and content, which will close the gap between the rocket-like progress of technology and the snail's pace of education; and (c) the application of useful concepts and processes from the new technology to the educational enterprise itself in order to close this ever widening gap.

Such a procedure will be a serious and difficult matter. It is not here suggested that educators take up a new fad. If automation and its related concepts are grasped by eager curriculum workers, school administrators, and professors in teacher education institutions, at the level of understanding and performance that some of the recent fads in education have been handled, we shall be worse off than before. We emerged from the "group dynamics" fad witnessing hundreds of people at various levels in education talking about a process they didn't understand and, fooled by their acquisition of the vocabulary, attempting to do things with group processes and with the results of group dynamics research that couldn't be done—as well as not doing other important things that should have been done.

We are still gripped today by a "3 R's" fad and a "gifted" fad which, presumably, will be dropped at the introduction of some other new idea that will make "experts" of its first practitioners long before they have an inkling of what they are either doing or talking about. Automation cannot be treated this way. To repeat, it is a serious and difficult business and offers no haven for the educator looking for something with which to impress the Teachers' Institute next fall.

Inasmuch as the audio-visual approach to communication is, strictly speaking, an attempt to solve a difficult human problem with technology, and, inasmuch as ideas have recently been

advanced in several quarters that audio-visual technology might well become the means by which the process of education itself might become "automated,"[1] it follows that students of audio-visual communication must lead in the examination of the relationships of automation and education. The writer proposes to do this under three general headings, this paper covering the first. The three headings are: (a) General Aspects, (b) Automatizing the Classroom, and (c) Built-in Dangers. Future papers will deal with the other two topics.

In considering the topic of automation and education from the audio-visual point of view, there is a temptation to go directly to the central question continually raised by Dr. Eurich; namely, Can we, with audio-visual materials and devices such as film or TV, extend the range of the master teacher and replace the mediocre or non-existent teacher? However, because of the complex nature of the automation concept and because it will have other effects on education which, in turn, will affect the audio-visual movement, it is necessary to begin the study by analyzing the more general relationships of automation with education. This background study is the theme of this article.

The idea that the Second Industrial Revolution and automation, one of its main products, will have a profound effect on education is not exactly new. Statements abound to this effect, including one of the author's (14). However, the existence of ideas and their immediate or even consequent effect on educational practice is very difficult to establish, fads excepted. There is, as is well-known, generally thought to be a fifty-year lag between idea and practice. With the speed of the new technology, symbolized by the space satellite, this fifty-year wait simply cannot be tolerated. We are living in an era of fantastic change and everyone in education, from the superintendent to the janitor, must recognize this fact and be prepared to act upon it.

Dean Irving R. Melbo, in addressing a conference of school administrators, cited a need at the administrative level for educational statesmen. He then went on to define the characteristics of such a statesman, including the ability to recognize issues. In speaking to this point, he emphasized this modern problem of change in education:

[1] See, for example, numerous speeches and statements by Alvin C. Eurich, Executive Vice-President of the Fund for the Advancement of Education, including his 1956 Statement to the Association for Higher Education (13).

> The ability to recognize issues is all too often lacking among our educational administrators. But perhaps the fault lies with the institutions which trained them, because no man can recognize issues if he has not learned to think in terms of issues.
>
> The simple truth is that great economic and social forces flow with a tidal sweep over communities that are only half conscious of that which is befalling them. Wise statesmen are those who foresee what time is thus bringing, and endeavor to shape institutions and to mold men's thought and purpose in accordance with the change that is silently surrounding them. (23:2)

And, as the Second Industrial Revolution with its automatic controls so sweeps silently into our communities, all schoolmen would do well to remember the words of Whitehead, written over twenty years ago:

> Our sociological theories, our political philosophy, our practical maxims of business, our political economy, and our doctrines of education, are derived from an unbroken tradition of great thinkers and of practical examples from the age of Plato . . . to the end of the last century. The whole of this tradition is warped by the vicious assumption that each generation will substantially live amid the conditions governing the lives of its fathers and will transmit those conditions to mold with equal force the lives of its children. We are living in the first period of human history for which this assumption is false. (30:99)

Automation is one of the reasons why the immediate future will bring conditions that cannot be accounted for in the experience of mankind. Automation will radically alter our system of education. It will be well, if we are to recognize and study these issues, to attempt to define this phenomenon.

SOME DEFINITIONS

Automation is one of those concepts capable of several definitions. This is, no doubt, due to the fact that its meaning has not yet been fully developed. At present, automation is a term better described than precisely defined; automation represents a territory that can be mapped, but not surveyed to the last decimal point. Drucker, in his very illuminating discussion, states that "automation can be defined simply, though superficially, as the use of machines to run machines" (10:41).

Macmillan indicates the range of meaning inherent in the term. He speaks of

> . . . a great extension in the use of automatic devices, to take over the simpler kinds of work previously done by the men in charge of machines.

The word "automation" has been applied to this process and widely adopted. It was first used several years ago by engineers of the Ford Motor Company in the United States to describe their methods for automatically conveying workpieces between successive machines; but since then it has come to have a much wider significance, implying any process in which the lower functions of a human operator—both physical and mental—are taken over by self-acting devices. Interpreted in this way, the word "automation" clearly means more than mere mechanization. . . . (22:2)

The CIO Committee on Economic Policy refers to a three-level description developed by Baldwin and Shultz of MIT. The three levels are:

1. The level of *integration* or *"Detroit automation,"* which means the linking together of conventional machines so that the work proceeds from one to the other without human intervention (referred to by Macmillan in the statement about Ford engineers above).
2. The level of "feedback" control devices, which means the introduction of servo-mechanisms or other devices which operate machines without any human control. Adjustments of work output, etc., are governed by an automatic comparison with some standard with the information so derived fed back to the operating device to further govern its work.
3. The level of information control, which means the introduction of computing machines into the system. The computing machines record and store information, make computations and feed the results back into the system, establishing complete control of the whole operation. (6:3-4)

The United Automobile Workers, reflecting the concern of their president, Mr. Walter Reuther, have conducted extensive studies of automation. In a special report to the union, the UAW Education Department referred to automation by its characteristics, stating that automation involved:

1. *Information* that is fed to a
2. *controller,* which operates (and supervises to make sure the operation is done corectly)
3. a *servomechanism* which in turn operates the
4. *machine,* which can be a drill, a milling machine, a lathe, a typewriter, or anything else which serves a purpose, and all this happens in a self-correcting system which is known as a
5. *feedback circuit.* (29:30-31)

EXAMPLES OF AUTOMATION

As will be shown later, the descriptions above represent only the hard core, mechanical attributes of automation, and indicate that the concept, as it is developing today, has abstract, ideational properties which may be even more important. However, these

abstract properties are not possible without the solid grounding in industrial and scientific developments. To increase understanding, then, of the basis for these descriptive definitions, some examples of automatic production may be helpful.

The following examples, for the most part, are taken from the CIO report (6). Others could be cited. The Cleveland plant turning out Ford engines under the "Detroit automation" system links a battery of machines on a line 1500 feet long with automatic machine tools performing over 500 operations. The plant processes 154 engine blocks an hour with 41 workers. The same operation, under older mass-production methods, would take 117 workers.

The *Wall Street Journal* is the authority for the statement that Raytheon's television and radio division plant will be able to turn out 1000 radios a day with only two workers on the line, as compared with a former need of 200 workers. Office automation (this involves computers and other machines, but also structured planning) is shown in the John Plain mail order house in Chicago, where a computer handles 90,000 tallies a day in keeping track of an 8,000 item catalog. Insurance companies now going to computer operation are represented by one cited which makes 7,000 daily billings, 20,000 monthly calculations for dividends, and 130,000 calculations for agency commissions at a saving of from 175 to 225 clerical personnel. Finally, it is reported that General Mills has produced an automatic machine which will produce electronic equipment. This machine, it is claimed, will require only two workers and a supervisor and has a capacity of over 200,000 assemblies a month.

While these are examples of automation in office and factory, it should be emphasized that they are, as yet, examples. Outside of modern oil refineries, which are almost fully automatic, there are practically no fully automatic plants yet in operation. As John I. Snyder, Jr., president of U. S. Industries, points out, many industries are coming closer to it and have already automatized one or more *parts* of the production process (28). His own U. S. Industries was, in 1955, operating the only fully automatic factory—a government-owned, 155-mm shell plant in Rockford, Illinois. However, a recent study by the Research Institute of America of 1000 major companies found that 16 per cent saw automation as a factor in their industry at the present time and that an additional 23 per cent predicted extensive automation in

their industry within a decade. Only one-third of the respondents felt that automation would never affect them (4).

CHARACTERISTICS OF AUTOMATION

When automatic operations of various kinds are looked at together, certain characteristics seem to emerge. These characteristics are not mechanical or technical in a machine sense. Rather, they are conceptual, and, as such, have educational significance.

The first, and probably the most important characteristic of the new industrial revolution is the concept of *systems*. While this concept has been discussed before in connection with audio-visual administration, its pervasiveness in business and industry—in any large scale organization—has yet to be realized. The systems idea is best grasped in connection with an office which is undergoing automation. While many processes—billing, posting, etc.—will be done by automatic machinery in such a set-up, the important elements are the planning necessary for the whole procedure, the location and function of necessary personnel, the types of forms used, etc. A system has to be created which gears all of these elements into a smooth flow, with controls feeding back information throughout the process. The system is much more important than the computer which calculates interest rates, for example. A representative of a firm which installs automatic processing in offices was heard to remark recently that it would take his firm eight years to install a system in a large company.

The problem of systems and systems analysis is complex and cannot be treated here at any length. Much automatic machinery can do certain routine work infinitely better and faster than man. Aircraft warning devices are an example of this. But somewhere in any operation, there must be men. Men, machines, and information have all to be coordinated into a system which may begin when a prospect is furnished an insurance salesman or a blip appears upon a radarscope, and ends with the widow receiving a check or the refueling of an interceptor plane after its mission has been accomplished. No longer can the in-between operations be considered piecemeal. Automation means system integrated with system.

Secondly, such systems and such potentials for rapid production need control. The old fairy story of the salt-making machine

that went on and on grinding salt could easily be translated into a modern engineer's nightmare. There are many elements here, and at different levels. At the level of the mechanics of the production line, information is needed constantly as to the condition of the machines and the work; at the marketing level, information is needed as to style, inventory, price, etc. If a machine gets too hot, information must come back to a control-point and orders issued for lubrication, reduction of speed, or some other remedy; if too many of the wrong color widgets are popping off the end of the line, information again must go to a control-point so that fewer pink widgets and more blue ones are produced. The constant here, and a general characteristic of automatic operation, is the flow of information and the control of the system by that information.

The third general characteristic of automation springs logically from the two which precede it. The systems and control characteristics of automation demand *thorough analysis and long-range planning*. The huge capital involved, for example, in automatizing an operation [2] means that the operation cannot be carried on by caprice. Once an automatic operation is underway, it is very costly to stop it for extensive changes. Hence, accurate planning is required. This planning is, obviously, one of the main factors in the eight-year installation problem described above in connection with another insurance firm.

Planning, however, cannot proceed without analysis. Neither can a system function indefinitely without analysis. This is the reason that the terms "operations analysis" or "operational research" are closely allied to the development of automation, and, for that matter, of all modern technology. The term, operational research, is usually used to refer to the study of management problems from the point of view of the mathematician, the physical and the biological scientist. The operational research staff, for example, in a military headquarters, attempts to strip a problem down to its bare essentials, create a mathematical model of it, and solve for the best answer. As Dr. John Abrams of the Royal Canadian Air Force pointed out (1), in military operational research, use is made of such things as probability statistics, the theory of games, search problems, and the newer theories of value

[2] According to a story in the *Los Angeles Times*, the Farmers Insurance Group in Los Angeles recently installed an IBM 705 computer to control automatic operations. The cost was quoted as a rental of $36,000 per month.

and decision. These, of course, are all in the realm of mathematics. Methodologies from other sciences are also used.

While there is no doubt that the armed forces of several countries have pioneered in the area of operational research, the term is now being heard in reference to similar problems in industry. The very existence of computers as part of the automation process makes possible the solution of complex mathematical problems relating to operational research in a very short time. For example, in a recent issue of the *Harvard Business Review*, Gaumnitz and Brownless review the mathematics that should be required of managers (19). Decision-making in all forms of automation processes and complex systems requires long-range planning and operational analysis.

The mention of decision-making in connection with automation highlights the fourth characteristic of the process which is *decision-making*. Drucker points out that, in order to control such processes and systems and to make and carry out the necessary plans, many more better educated managers will be needed in the future (10). Decisions dealing with a complex system will have complex consequences. The implications here for education are tremendous.

Finally, although it should be obvious, it is necessary to point out that automation and its clusters of systems is a high order product of technology. That is, it is a *highly technical* business. While the operations themselves may be reduced to watching an occasional gauge or checking the accuracy of a bill for an insurance premium that has just come through a machine, the machines themselves and the systems within which they operate are exceedingly complex. Maintenance, for example, will require very able technicians.[3] The engineering behind some of the equipment involved in automation also presents great problems of design.

These, then, are some of the characteristics of automation and its associated processes and systems: (a) the concept of systems, (b) the flow and control of information, (c) scientific analysis and long-range planning, (d) an increase in the need for wise decision-making, and (e) a high level technology.

[3] For anyone who has not experienced this reality, let him see an ordinary automobile mechanic attempt to solve the problem of making a modern automatic transmission function when it has been jammed or otherwise damaged.

EFFECTS ON EDUCATION

Those who sense that all social and economic forces affect education in general, as well as specific ways, will realize that a list of the effects of automation on education could be almost endless. Obviously, there are concerns about technological unemployment, even if it may be temporary, and the age structure of our population for the next twenty years will bring less people into the labor force than we need. The need for maximum productivity for prosperity placed against a reduction in the labor force will hurry, rather than stay, the development of automation. A shorter work week seems to be inevitable. Industry will be interested, as never before, in a predictable expanding stable market—the risks are too great in capital, etc., to break down an automated system. This would imply that industry may have a stake in some kind of an annual wage. The initial high costs of capitalization for completely automatic production may operate to further change our economy in the direction of more big business. One authority has suggested that, with a great sameness of product possible from automatic factories, the day of the artisan and hand-worker may once again bloom (25).

All of these and many more possible social and economic effects have educational implications. It is too early to say what many of them will actually turn out to be. However, there are a number of more direct effects that can be identified and these effects will be pronounced at all levels of education. Consider carefully the following quotations:

> Automation's most important impact will not be on employment but on the qualifications and functions of employees.
>
> And this increase both in the numbers of managers and in the demands made on them may well be the largest of all the social impacts of Automation.
>
> One large manufacturing company (now employing 150,000) figures that it will need seven thousand college graduates a year, once it is automated, just to keep going; today it hires three hundred annually.
>
> But the need is above all qualitative—for better educated people. The "trained barbarian," the man who has acquired high gadgeteering skill, will not do. Even in routine jobs, Automation will require ability to think, a trained imagination, and good judgment, plus some skill in logical methods, some mathematical understanding, and some ability well above the elementary level to read and write—in a word, the normal equipment of educated people. Under Automation, a school could do a student no greater disservice than to

prepare him, as so many do today, for his first job. If there is one thing under Automation that is certain, it is that the job—even the bottom job—will change radically and often. (10:44-45)

In the conditions of modern life, the rule is absolute. The race which does not value trained intelligence is doomed. Not all your heroism, not all your social charm, not all your wit, not all your victories at land or at sea, can move back the finger of fate. Today we maintain ourselves. Tomorrow science will have moved forward yet one more step, and there will be no appeal from the judgment which will then be pronounced on the uneducated. (5)

Information theory is the science underlying all exchange of information, and is of especial importance in the development of telecommunications and automatic control systems. The treatment adopted by the author has enabled him to *give a clear account of recent developments without requiring a knowledge of mathematics in excess of that which may reasonably be expected from the professional engineer or physicist.* (From a book jacket—italics supplied.)

The First Industrial Revolution, the revolution of the "dark satanic mills," was the devaluation of the human arm by the competition of machinery. There is no rate of pay at which a United States pick-and-shovel laborer can live which is low enough to compete with the work of a steam shovel as an excavator. The modern industrial revolution is similarly bound to devalue the human brain, at least in its simpler and more routine decisions. Of course, just as the skilled carpenter, the skilled mechanic, the skilled dressmaker have in some degree survived the First Industrial Revolution, so the skilled scientist and the skilled administrator may survive the Second. *However, taking the Second Revolution as accomplished, the average human being of mediocre attainments or less has nothing to sell that it is worth anyone's money to buy.* (Quoted in 26:13. Italics supplied.)

These quotations are enough to give any thoughtful educator pause. Some of their possible implications and the implications in general of automation may be discussed under four headings: (a) the curriculum and program of studies, (b) administration, (c) the possibilities in automatizing the process of education itself, and (d) changes required in theory. These will be briefly delineated.

The first problem under the program of studies category is the role and placement of subject matter. It can be suggested that those educators who relegate "subject matter" to limbo or who suggest that "we only work through subject matter to something else" are echoing the cliches of the 1920's without meaning in 1957. For certain groups of students, subject matter *per se* will have a new importance. This is not to suggest that all the gains in dealing with individual persons, in attempting to change behavior through

problem-solving, etc., need be thrown out. It does suggest that a technological society needs technical information in the possession of a rather large group of its members.

Specifically, mathematics will continue to play a greater role than ever in our lives. A thorough revision of the classical mathematics curriculum at the secondary level is called for, in addition to a strengthening of the program at the elementary level. Solid geometry, for example, is according to many modern mathematicians, an interesting but obsolete subject and should be dropped. The high school mathematics program can be revised (and this is being done in a few places) so that, for example, the elements of calculus will be taught to *some* students in high school.

The science phases of the elementary curriculum need revision and strengthening. In many elementary schools in the United States, science instruction is a joke. If so, this may be a pretty high price for our society to pay for a few laughs. Actually, at least for some children, the self-contained classroom in the upper elementary level with its extreme emphasis on social living should be due for a thorough going over. It may be that for some children, we will want some form of departmentalization with a pushing downward of some of the elements of the present high school curriculum. This will mean an earlier transition from a developmental curriculum than most people in elementary education are now willing to make.

Another concept that must be re-examined—and at the very highest levels of education—is the concept of general education. The last twenty years have brought great pressures for general education—for an education so that we may appreciate our common heritage, etc., etc., etc. Survey courses, Great Books, the Harvard essentials, "exploration" courses, and work-experience programs are all examples of this sort. There has been a great deal more worry among the Mark Van Dorens, Mortimer Adlers, and A. Whitney Griswolds about whether or not our technicians, engineers, and scientists could talk to each other than whether or not they were good engineers, scientists, or technicians (I include the social sciences here). The spokesmen for general education have, actually, attempted to create a *specialist in general education* under the guise of dealing with the well-known ignorance of specialists.

It is a moot point whether or not a highly technical society can

survive and maintain itself without highly specialized technological know-how. It takes time to acquire this know-how. Without decrying general education, it would seem that this extreme emphasis upon it should be re-examined with a view to reducing the time devoted to it. It is recognized that this is in opposition to Drucker's position that the managerial talent of the future will have to have a general education. It is my feeling that Mr. Drucker has become enmeshed in his own net in this instance. Management is, or will become, a highly skilled profession. Mr. Drucker does not want general education; he wants general professional education, and the distinction is important.

The implication of a few paragraphs above—that not all students should have the same education—can be stated in the proposition that education for an age of automation will require homogeneous grouping of students in the public schools and recognition of different patterns of preparation. This is not necessarily to say that an intellectual elite will be created after Grade 4, although this is possible.

The well-known facts of psychology relating to the extreme variations in individuals and the fact that individuals may be homogeneous in one respect and not in others will require a re-examination of even the principle of homogeneous grouping. But it is still reasonable to expect that not all high school students will be able or find it necessary to take the elements of calculus. The great problem here is to find ways and means of shortening and improving the general education periods so that all students can function as citizens, parents, etc., and, at the same time, meet the demands of a technological society for specialists (18). Perhaps the greatest educational dilemma of our time may be stated as follows: *If these two objectives come into complete conflict, a technological society, in order to survive, has no choice but to pick technology.* We may not like the world we so create (and some possibilities in that direction will be discussed in the third paper in this series), but we must recognize it for what it is.

Computers, cyclotrons, and magnetrons—all paraphernalia of the age of automation—point up another great fact that is powerful enough to shake the structure of the whole curriculum from the kindergarten to the graduate school. I refer here to the almost unbelievably rapid growth of knowledge. This is a problem which most curriculum people have ignored by the simple process of duck-

ing their heads in the sand of "attitude formation" and "problem-solving skills." Incidentally, it has also been completely ignored by their opposite members of the *Saturday Review* set who still think that Aristotle had no need to count the number of teeth in his wife's mouth. The poets, the Greek plays, the socio-drama, and the resource unit do not necessarily have the answer to this problem. The solution must lie in thorough revision of content and the development of means to teach more to more people in less time.

The systems concept and related matters emphasize the fact that, while group dynamics has not yet got beyond the stage of a primitive religion in most curriculum circles, it has the key to many problems that will beset an automatized world. Human relations, group relations, even international relations, become proper subjects of study and necessary areas in which to develop real skill and proper attitudes. Again, here, the problem may be methodological. The solution will not be found in the technique used by a professor of education in holding a "buzz session" or in having committee reports made in class—any more than it will be found in some of the so-called "work-shops" run by school districts under the euphemism of an in-service training program. We need to develop content and method which yields measurable results in this field.

There are many other implications for a curriculum content in an age of automation. To create decision-makers means that the thought processes of students must have experienced conflicts and made decisions; to analyze, to plan, to create systems and to live within these patterns implies an ablity to think in patterns, to take the long-range view, to be creative. Those information-mongers, those fact-purveyors who felt that the position stated above with regard to subject matter was their meat had better keep this fundamental in mind. No mountain of facts will do more than provide the background for this process. Our new curriculum must do so, but not in any sloppy way, based on the assumption that if the children learn how to solve the problem of waste-paper in the cafeteria over a semester's period of time, they have demonstrated outstanding ability in pattern-thinking.

The problems of additional leisure time, the problems of vocational training in a world where vocations will change and buttons or magnetic tapes take their place all need consideration for the new curriculum. The best that we can say is that we have had

curriculum challenges before, but never of the intensity and urgency that the coming age of automation presents us.

The second category of possible effects is that of administration. As I have discussed some of these problems elsewhere (15), (16), (17), I will merely enumerate them here. The new management concepts—systems, operational research, the use of the theory of games, etc.—all have much to offer school administrators. The theory of school administration—in my opinion, already somewhat creaky—needs a thorough re-examination in the light of these new developments. It is not overstating the case to say that education for an age of automation needs an administrative theory that is at least able to keep up with it. This is a great challenge to theorists in the field of administration and to practicing administrators. If administrators are to lead, it would be well to begin by streamlining their own operations to fit the demands of a new world.

Third, much needs to be done in considering how far we may go in automatizing the process of education itself. Here, as was mentioned before, lies the direct relationship between the audio-visual field and the concepts of automation. This topic will be the subject of the second of these studies. Can the somewhat cold process of closed-circuit television, for example, increase educational efficiency without losing something in the process?

Finally, when all this is added up, what changes can be expected in our intellectual structure—in the content of "education" itself? Certain things have been mentioned—a re-examination of curriculum theory, especially as it applies to the program of studies, and of administrative theory. It is to be expected that new bodies of such theory will be created and studies conducted on hypotheses based upon these theories.

Actually, education, as a subject of study, has stood on a plateau for about 20 years. The audio-visual field is one exception to this statement. The curriculum books still say much the same thing; the speakers at institutes and meetings are still re-working the old material. Education, as a discipline, is in the position it was around 1900 when a new graduate content was created almost overnight by Thorndike, Dewey, Monroe, and a few others.

We are on the edge of a breakthrough. It will, in fact, be forced upon us by circumstances if we do not make it ourselves. A new content for education as a discipline needs to be made. Already, beginnings can be detected. For example, most of our

psychology—and certainly all of it that reaches the teacher-training level—is individual learning psychology with overtones of growth and development. Social psychology—the study of the behavior of people in groups, their responses to mass communications, etc.—has emerged as a separate discipline. Much can be gained by working pertinent material from this important field into teacher education programs (again, the audio-visual field has tapped social psychology more for its data than any field in education.)

New philosophies of education need to be created. The recent NSSE Yearbook is rich in suggestions in this matter (24). All of the remaining social sciences—anthropology, political science, international relations, etc.—can contribute much. Experiments in the biology of the mentally retarded, new advances in psychiatry, and the new stress theory of disease can all give a little to the new content in education. We need now to work with experts in these disciplines and get the material flowing into our thinning lifeblood that still carries the weak corpuscles of "life-adjustment" and "purposive activity." The age of automation will require it.

One final word as to the content of education as a discipline. Much has been heard in recent years from critics of education, such as Arthur Bestor, that "there ain't no such thing" as a content in education. Bestor's position, of course, is untenable. However, it has, no doubt, been true that some courses in education have been sadly lacking in the content that was there for the asking. The new content that the age of automation suggests will be much more demanding intellectually than that we already have. The problems of teacher education will become, therefore, more acute. No true profession in the age of automation will be able to slough off its intellectual obligations. This includes teachers now who consider a course difficult when it has two twenty-minute examinations.

SUMMARY

An attempt has been made in this paper to describe automation, both as an industrial process involving flow and control and as an intellectual system involving planning and decision-making. General effects on education in the areas of curriculum and program of studies, administration, general education, organization for instruction, the necessity for teaching new patterns of think-

ing, vocational and technical education were discussed. The concept of the possibility of automatizing the instructional process itself was introduced, and the outlines of a new content for education as a discipline were suggested. The following paper will deal with the problem of automatizing instruction through audio-visual means, and the third and last paper in the series will consider the dangers and difficulties involved in such a process.

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PSYCHOLOGICAL CONCEPTS AND AUDIO-VISUAL INSTRUCTION[1]

• C. R. CARPENTER

In this article the author draws upon his years of experience as a psychologist to make an application of psychological concepts to audio-visual instruction. C. R. Carpenter is head of the Psychology Department and director of the Instructional Research Program at Pennsylvania State University.

Purpose

THOSE individuals who are responsible professionally for using the vast array of audio-visual materials and methods have justification for expecting to find in conceptual systems of the learning processes useful precepts, axioms and principles applicable to their work. It is the purpose of this article to outline some selected but fundamental concepts about learning which should be useful in improving teaching by means of audio-visual materials. The concepts to be presented are selected in terms of their estimated usefulness in preparing, selecting and using audio-visual materials. Controversial theoretical discussions are avoided. Likewise, oversimplified "formulas" and overextended generalizations are avoided.

It is hoped that this article will be a useful, condensed, and meaningful guide for professional audio-visual teachers and administrators who are interested in the persisting and perennial problem of improving the processes of teaching and learning.

Complexity and Variety of Audio-Visual Materials and Methods

Ideally the psychological concepts to be stated should be selected and applied for *specific kinds* of audio-visual materials. However, the diversity and variety of these prohibit such a detailed treatment. It is not reasonable to expect that the same

[1] The article was written while the author was on vacation and away from specific reference material.

psychological concepts will apply in detail, and equally well, to all kinds of stimulus materials like sound recordings, photographs, real objects, models, diagrams, sound motion pictures and television. The problem in general is to abstract from all or most audio-visual teaching materials and methods those general characteristics to which may be applied abstracted and generalized concepts of learning. The question becomes this: What are the most useful guiding concepts, generalizations, statements and principles which can be selected from a great diversity of learning theory and applied appropriately to the range of instructional materials and methods in order to advance learning toward many different educational objectives?

General Characteristics of Audio-Visual Materials

Justification for the use of audio-visual materials should be based on their distinctive and perhaps unique characteristics and *possible* contributions to learning. Their advantages and disadvantages should be defined *functionally* and in relation to the advancement of learning. These should then be tested by experimentation. Among the assumed advantages and characteristics the following may be listed:

1. To increase and sustain attention and concentration
2. To provide concreteness, realism and "life-likeness" in stimulus situations calculated to instigate learning
3. To explicate and increase the meaningfulness of abstract concepts for the student
4. To bring remote events, remote in either space or time, into the classroom for students
5. To introduce opportunities for situational or "field" types of learning as contrasted with linear-order-verbal and written language communication
6. To facilitate or advance the processes of applying what is learned to realistic performance and life situations
7. To stimulate interest, increase motivation, introduce variety of stimulation and generally to increase the "personal involvement" of students in learning.

These and other characteristics should be delineated and proven.

The same should be done with the assumed disadvantages and limitations. Is it not true that any teaching method or stimulus material vis-a-vis other methods and materials have both advantages and disadvantages for specified purposes which need to be

relatively evaluated? The following examples of possible disadvantages are among those which need to be studied objectively:

1. The effort and expense required in the production, distribution and use of audio-visual materials
2. The relatively greater amount of time required for presenting audio-visual materials compared with traditional written-verbal methods
3. The limitations of audio-visual materials for communicating abstract meanings
4. The difficulty of teaching general principles by means of specific and concrete models, objects and pictures of objects or representations of real, specific situations
5. The difficulty of matching the variety of instructional materials with the variability of individuals in classes and groups
6. The problem of personalizing instruction for students when sound motion pictures and television are used.

Limitations that characterize audio-visual materials, when accurately defined, should be managed by designing and applying compensatory and supplementary teaching procedures.

These examples and other definable characteristics of generalized audio-visual materials and methods should relate meaningfully to fundamental concepts of learning and motivation.

The Importance of Motivation of the Learner

A general result of extensive research on audio-visual materials and methods is that the stimulus characteristics of materials can be systematically varied over a very wide range without producing significant variations in the *measured* learning of students. These results are puzzling and difficult to interpret. It is believed that the results relate to theories and assumptions which overemphasize the potency of immediate stimulation and underemphasize the importance of motivational processes which are intra-organismic and which operate in the life history of individual learners. Seemingly, provided the stimulus materials are adequate, i.e., have stimulus values which fall above thresholds of perception and cognition of perceiving and understanding, then the amount and kind of learning is predominately determined by the capacities and motivational processes of the individual learner rather than the stimulus situations. Therefore, it would seem that the most important and persistently basic task of teaching is to release, instigate, and increase such motivational processes and forces as interest, the need, desire or wish to learn. Simply stated, the

principle is that when an individual is given an opportunity to learn, and stimulus situations are perceivable, then the amount and kinds of learning predominately depend on the individual's abilities and *motivation.* The modern version of Titchener's "stimulus error" concept is an overexpectancy of the potency of immediate stimulation of the individual as a means of reorganizing habit systems, of modifying old and teaching new concepts, and of restructuring attitudes and value systems. These considerations lead to the conclusion that the primary task of all teaching including the functions of audio-visual materials and methods is to increase and direct the motivation of students.

The Personal Relevance Concept

Habits of action, patterns of experience, modes of thought, concepts and systems of meaning are all personalistic. They do not exist separately from individuals. Facts and principles, systems of knowledge and values, patterns of perception and motor skills all become alive and significant only within the context of individuals and the relevant parts of their "life space." Materials presented for learning by teachers may be and long remain remote, ineffective, sterile and impotent unless they are relevant to lives and goals of students. Furthermore, it can be assumed reasonably that teaching materials are effective in an ordered manner depending on the degrees of their *personal relevance* to individual students. Essentially this means that the problems of producing, selecting and using audio-visual materials and building them into curricula and courses of study require continuous judgments of their relevance to the individuals to be taught. More specifically these considerations involve appropriateness of materials to abilities and levels of achievement of students, their activated or latent interests, their effective motivation and their accepted objectives of academic achievement.

Selective Processes and Audio-Visual Instruction

What is presented to students and what is accepted and learned by them are very different. Considerable experimentation and widespread practical experience confirm the proposition that selective processes are operative at all levels of human experience and at all stages of the communicative processes among individuals. This is certainly true for communication between the teacher and the

taught. Current psychological literature emphasizes selective perception. Selectivity, however, does not begin or end with perception of stimuli or stimulus situations. What is presented to be seen, heard or otherwise sensed has been subject to selective procedures by the culture, the institution, and certainly by the teacher. Furthermore, selectivity operates at the level of cognition or understanding. Then in turn, responses are made selectively and a fundamental problem of memory is that of knowing the determinants which result in different kinds and degrees of "retention" and "forgetting." Chains of communication, which include teaching, can be conceived of as a sequence of events with selective filters operating between each major contiguous link in the chain. The "output" or response can be expected, therefore, to differ greatly from the "input" stimulation. The organism or individual interposes its entire *relevant* life history between the stimulus material and his or her response.

Individual Contributions and Modifications

Search for reasons for the lack of close correspondence between the instructional stimulation and learning response leads to the illuminating concept of the *releasor* functions of signs and symbols. A part of the responses of individuals to charts, graphs, models, photographs, words, etc., is that of *adding relevant meanings and responses* from the repertoire of previously acquired experience and habit systems. When stimuli interact in an individual with previously organized knowledge, values or habit systems, relevant parts of these organizations are activated or released. Which parts are released, are almost unpredictable without a thorough knowledge of the individual and his entire past history—a goal that is most difficult to achieve. Thus, along this line of reasoning, individuals respond to stimuli and communicative cues by adding personalistically relevant reactions.

The variability of responses from individual to individual, and in the same individual from time to time, relates to a characteristic of communication processes termed *ambiguity*. Conceivably the greater the ambiguity the greater the variability of response to given stimulus materials.

A characteristic of object-graphic communications is that they are less ambiguous than abstract spoken or written symbols.

This characteristic may be advantageous or disadvantageous depending on the instructional objectives.

Individual Variability

The drift and theme of this article emphasizes the importance of individual variability or differences. Standards of instruction and educational objectives require that millions of individuals who vary greatly in their abilities, strengths of motivation, interests, and conceived goals of achievement must acquire a defined and limited body of knowledge, skills, and attitudes. The question of how to achieve desirable common educational standards, while at the same time managing the problem of great individual variability, is a persisting problem for all educators including the professionals in the audio-visual field. It may be helpful to realize that common and defined objectives and standards of learning can be achieved by many different approaches, by different materials and methods, at different rates and at different stages of the development of individuals. In this complex area, as yet, reaching decisions as to how and when to use different audio-visual materials and methods is perhaps more of an art than a science.

Effort Is a Requirement of Learning

All learning requires effort and the expenditure of energy in relation to the difficulty of the task. All achievement goals are to be reached at a price of energy expenditure. Much learning is "unpleasant" and involves "pain" and hard work. There is the necessity for deferred satisfactions and for accepting frustrating delays in fulfilling needs and gratifying desires. Striving, exploring, risking failure and achieving the satisfactions of success are essentials of individual growth and development. This organic naturalistic view of learning contrasts sharply with the "laissez faire," "pleasure principle" of much modern education. Especially, it would seem, those responsible for audio-visual programs of educational systems, at all levels, should give systematic attention to these different philosophies and theories of learning. The conclusions should indicate that audio-visual materials and methods of instruction are as demanding of disciplined study, as rigorous and as challenging as other methods which are more generally sanctioned by educational traditions of the past. It may be wise in the current "climate of opinion" in educational circles for proponents

of audio-visual approaches to learning, to make certain that these approaches are applied in ways to counteract students' tendencies toward indolence and to follow the "law of least effort."

The Need for Organization

The processes of organizing separate facts and "bits" of information into meaningful cohesive wholes are of basic importance in presenting materials to be learned. Given constant amounts of effort and time, organized materials advance and extend achievement more effectively than unorganized or poorly organized materials. More information can be learned more enduringly when materials are meaningfully and systematically organized than when they are presented particularistically. Audio-visual units typically require perceptual field organization, but there is the persistent problem of weaving these perceptual fields into larger segments, units, and integrated structures of experience. What can be done by instructors should be done to encourage and facilitate organization of learning in frames of reference of importance or significance, of usefulness, both now and in the future, of relevance to valid learning objectives. However, great variation should be expected in the patterns of organization, reorganization, and interpretation which result from the attempts of individual students to assimilate the information. It should be clear to teachers as well as to students that the primary responsibility for learning any subject and integrating it into a "life frame" is that of the student. Getting students to accept the responsibility for their own learning, including organization, interpretation, and application of what they learn, is a major task of teaching.

The Problem of "Participation" and Practice

A widespread criticism of projected audio-visual materials and methods is directed at an alleged reduction of "participation" and overt practice. The criticism springs from the lack of systematic thought about the full range of *actions* inherently involved in learning and the reinforcement of learning which results from these actions. Seeing and hearing are activities. Complex perception is activity. Thinking is action. Using symbols, abstracting, deducing, generalizing, inferring and concluding are all activities intimately involved in learning. Furthermore, these activities are probably more central and appropriate *to high level brain work*

and intellectual efforts than many of the skeletal muscle activities so much emphasized in some classrooms including science laboratories. Granted the need in learning for active interest, strong personal involvement, for "sharing," for cooperative effort and for hard goal directed work, this need may *not* be satisfied by merely stimulating gross *overt* action. Such gross overt action may actually interfere with some kinds of learning. Learning is activity, but all forms of activity are not learning. Furthermore, different kinds of activity affect and facilitate or inhibit learning in different degrees. *Covert* activity may be more or less effective than *overt* activity depending on the level of development of the individual and the requirements of the learning task.

Repetition and Variation of Stimuli

Repetition of presentations of stimulus material for learning seems to be one of the most powerful variables which has been studied experimentally. Generally it may be said that nothing absolutely new is ever learned effectively with one exposure. Due perhaps to the time required for presenting audio-visual materials there is usually, it is believed, a serious neglect of the principle of repetition and reiteration. Repetition functions to reinforce and extend learning and to make the learned information more enduring.

When should feasible repetition be combined with variations of the stimulus materials? Variations operate to sustain attention, to instigate interest, but also to broaden the pattern of learning. Furthermore, variations of stimulation in all probability aid students to generalize and apply more widely and surely what they have learned.

Finally, repetition and especially repetition with variations provides *time* for learning and time for learning is absolutely essential.

The Rate of Presentation of Materials To Be Learned

Time is an indispensable factor in learning. Therefore, the rate of presentation of information in relation to the *comprehension rates of students* is a fundamental consideration. The presentation-comprehension rates not only interact but these rates interact with other variables. Of these other variables the demands made on the learners by the number, complexity and *subjective* difficulty of the materials are most important. Therefore, the

pacing or determination of the rate of presentation of a body of information is a problem which must be solved for all instructional materials and methods. This pacing is particularly difficult to estimate for those media like sound motion pictures and television where student responses cannot regulate the predetermined or remotely determined rate of presentation. Decisions are required on what is the optimum rate of presentation for specific information to be learned by students with given characteristics.

Summary

This short article attempts to bring to bear some selected psychological concepts on problems of audio-visual materials and methods. It is recognized that the complexities, both of learning concepts and of audio-visual materials, set severe limits to this discussion. The article is not an attempt to give the reader documented experimental and conventional results.

Examples of advantages and disadvantages of audio-visual materials in general are selected and stated.

Brief descriptions are given of *selected* psychological concepts and these are related to the audio-visual approaches. The importance of motivation is stressed. It is argued that the concept of personal relevance of materials to the learner is a central one. An attempt is made to show that selectivity operates broadly and deeply in all teaching and learning. It is proposed that individuals contribute to and importantly modify the information presented to them. Variability of reactions relates to ambiguity of information. The problem of individual variability is raised and related to the requirements of educational standards. Goal oriented striving which demands hard work and energy expenditure is proposed and contrasted with the permissive "pleasure principle" conception of learning. The requirements are stated for having materials organized while expecting reorganization by students. An attempt is made to broaden the widespread popular concept of "participation," and thus to meet a persisting criticism of many types of projected audio-visual aids.

The concept is presented of repetition and variation of stimulus material as means of improving the effectiveness of instruction. Finally, attention is directed to the concept of the need to make decisions about the optimal rate of presentation for the most effective learning and comprehension by students.

FILM COURSES IN U.S. COLLEGES AND UNIVERSITIES

• JACK C. ELLIS

This is the third in a series of articles surveying the place of film in colleges and universities. It is taken from the author's unpublished doctoral dissertation, Approaches to Film as an Art Form: A Handbook for College Teachers, *completed at Teachers College, Columbia University, in 1955. Jack C. Ellis is assistant professor of film in the School of Speech, Northwestern University.*

SINCE THE end of World War II a growing interest in the film training provided by American colleges and universities has accompanied an increased amount of community and campus film activity. To date this interest has shown itself chiefly in a concern for professional training in film. Teachers of drama and speech, who have assumed some of the responsibility for professional instruction in the newer dramatic medium, have contributed to this interest through their national organizations, the American Educational Theatre Association and the Speech Association of America. The motion picture industry has a constant need for trained technicians and the Society of Motion Picture and Television Engineers has looked hopefully to educators for assistance. All three organizations have sponsored surveys of college and university instruction in film. On an even larger scale, UNESCO has demonstrated its concern that film workers be prepared for the best use of this powerful vehicle for international communication. A world-wide survey of the *Professional Training of Film Technicians,* published by UNESCO in 1951, emphasized the importance of the university's role in this country for formal education in film: "In the United States, instruction in technical and other branches of the film industry is essentially a university matter" (2).

SURVEYS OF COLLEGE COURSES IN FILM, 1946-1950

In May 1946 at a Technical Conference of the Society of Motion Picture and Television Engineers, Chairman John G. Frayne presented a "Report of the Committee on Motion Picture Instruction" (1). The Committee had sent a questionnaire to 155 "institutions

of higher learning" and received replies from 102, or approximately 66 percent. Of this number, 60 were universities, 30 were colleges, eight were technical schools, one was a military academy, and one was an armed forces institute. They reported 86 film courses, which were classified by the Committee under such headings as "Cinematography," "Motion Picture Distribution," "Economic Problems in Motion Picture Production and Exhibition," "Film Processing." Semester hours and credits and in some cases brief descriptions were given for each course. Frayne's report concluded with comments on the possible value of this education for motion picture professions, with particular emphasis upon what he felt to be a paucity of technical courses.

In 1949 a follow-up study was undertaken by another group, the Committee of Film, Radio and Television of the American Educational Theatre Association. The results were presented at that Association's 1949 National Convention by Jack Morrison, member of the Department of Theater Arts, U.C.L.A. (3). Because of a larger sample and a broader scope, the follow-up study reported 300 motion picture and "related" courses compared with Frayne's 86.[1] The number of institutions offering a comprehensive major in motion picture production seems to have increased from two in 1946 (U.S.C. and N.Y.U.) to four in 1949 (U.C.L.A. and C.C.N.Y. were added). Morrison concluded that, despite increasing attention to motion pictures in education, there was little significant change in the teaching of film production between 1946 and 1949 among the schools included in the Frayne study.

In April 1951 another report, of the Committee on Motion Pictures of the Speech Association of America, was prepared by Buell Whitehill Jr., Chairman of the Department of Speech, University of Pittsburgh (4). This Committee sent a questionnaire to 610 colleges and universities during 1949-50. Replies totaled 278, or 46 percent. Answers to the questionnaire included the information that courses in motion picture appreciation were being offered at 26 colleges and universities in 16 states. California, New York and Pennsylvania led with seven, four and three, respectively. Colorado and Missouri each had two institutions offering courses in this field. Eighteen schools were found to offer technical courses (de-

[1] Though more schools obviously were polled, Morrison gives no indication of their number or of the percentage of returns. He adds the following categories: "Motion Picture Acting," "Screen Writing," "Motion Picture Directing," "Motion Picture Lighting," "Documentary Film," "Animation," "Film History and/or Aesthetics," "Film Appreciation," "Film Design," "Survey of Production Techniques," and "Miscellaneous."

fined as "above the appreciation level"). California and New York led in this respect.

An additional survey was undertaken for the present study in order to provide a more recent picture, supplement the earlier surveys, and assess further the development of college film teaching. The curricula of the hundred largest colleges and universities were examined.

SURVEY OF COLLEGE COURSES IN FILM, 1952-1953

In conducting this investigation, all of the 1952-53 bulletins of each of the 100 schools were inspected for mention of film.[2] Only credit undergraduate and graduate work was included in the tabulation. Courses in which films were used solely as audio-visual aids, to illuminate other subject matter or impart skills, were not counted as dealing with film. On the other hand, audio-visual courses which dealt with the evaluation and use of educational films, and sometimes with motion picture appreciation, were considered to give attention to the medium itself and were counted as courses in film. Though audio-visual courses with descriptions referring only to audio-visual "media," "materials," or "aids" were counted,[3] social science courses concerned with "mass communication media" (or even "press, radio, and other mass media") were not counted unless specific mention of motion pictures was made. This distinction seemed justified since social scientists tend to favor press, radio and television—the pervasive media of information on which more and better research has been done—whereas the 16 mm film is the bulwark of most audio-visual programs. Also omitted were methods courses in which, though evaluation of films was mentioned, the subject matter did not seem to allow for primary attention to the medium.

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[2] The 100 schools were selected according to enrollments listed in U.S. Office of Education, Federal Security Agency. *Education Directory (1951-1952) Part 3, Higher Education* Washington, D. C.: Government Printing Office, 1951.

Summer session announcements were excluded. A yearly feature of *Educational Screen* covers a large number of the summer audio-visual offerings. According to this listing, 241 schools in 46 states and the District of Columbia presented such courses during the summer of 1952—"Summer Courses in the Audio-Visual Methods and Materials." *Educational Screen* 31:206-208, 248; May and Summer 1952.

Bulletins from every campus of each of the schools, as indicated in the *Education Directory, op. cit.*, were included; e.g., bulletins for each of the eight campuses of the University of California. But when the same course was given on the different campuses, in several sections, or listed in more than one department, it was counted as only one course. Two-semester courses were counted as one course unless the second semester had a separate catalogue entry and a significantly different approach (or intensity) from the first semester, in which case they were counted as two courses.

[3] When, however, the "audio-visual aids" in course titles and descriptions were extremely ambiguous ("Audio-Visual, Radio, and Other Instructional Resources"), or when the audio-visual media were specified and film was not among them ("Preparation of Audio-Visual Aids . . . including such materials as graphic aids, mounted materials, handmade slides, photographs, filmstrips and recordings") the courses were not counted.

The findings are discussed under three headings: distribution of film courses by state; number and types of film courses; and departments sponsoring film courses.

Distribution of film courses by state. Film courses, in the 100 largest schools, were offered in 32 states and the District of Columbia, which seems to indicate a "grass roots" concern with film. As might be expected, the greatest number of courses were, in general, given in areas of high student population—Northeast, Midwest, and Pacific Coast. Of the 14 states in which 10 or more courses in film were taught, three were in the East, seven in the Midwest, one in the Rocky Mountain region, one in the Southeast, one in the Southwest, and one on the West Coast. The exceptionally high number of courses offered in California (25 percent of the total) and New York (14 percent) is attributable to factors in addition to student population. These two states contain the chief film producing centers, Los Angeles and New York City, which provide employment opportunities for film majors, and instructional staff from among film makers. Other states in the sample which led in the percentage of film courses offered were Texas (7 percent), Massachusetts (5 percent), Ohio (5 percent), Illinois (4 percent), Pennsylvania (4 percent), and Indiana (3 percent). The remaining 33 percent of the courses were scattered among 24 states and the District of Columbia. The total number of courses in each state offered by the 100 schools is given in Table 1.

TABLE 1—FILM COURSES OF THE HUNDRED LARGEST COLLEGES AND UNIVERSITIES, DURING 1952-1953, LISTED BY STATE

State	Number of Courses	State	Number of Courses
California	146	Oklahoma	8
New York	81	Kentucky	6
Texas	41	Louisiana	6
Massachusetts	30	Oregon	6
Ohio	30	Washington	6
Illinois	24	Georgia	5
Pennsylvania	24	Kansas	5
Indiana	23	New Jersey	5
Michigan	19	Alabama	4
Minnesota	18	North Carolina	4
Florida	16	Tennessee	4
Wisconsin	12	Connecticut	3
Colorado	11	Nebraska	3
Missouri	10	West Virginia	3
Utah	9	Arizona	2
Iowa	8	Maryland	2
		District of Columbia	1
		Total	575

Numbers and types of film courses. Although film courses were given by schools in many states, the courses were not distributed evenly among these schools. When ranked according to number of courses offered, the top 20 percent of the schools accounted for 62 percent of the total. In general, the largest schools offered the most courses; the 20 largest gave 43 percent of the total 575 courses.[4] There were, however, many exceptions to this general rule. The University of Southern California, though twenty-sixth in size, offered by far the largest number of courses (66). Baylor University, eighty-fifth in size, was fifth in the number of courses (18), and San Francisco State College, ninetieth in size, ranked tenth in the number of courses offered (12). Conversely, the fifth largest school, the University of Illinois, offered only five courses dealing with film. Northwestern, ninth largest, offered only three, as did the University of Michigan (eleventh largest). Brooklyn College (sixteenth largest) and the University of Cincinnati (nineteenth largest) offered only two. Some of these exceptions to the correlation between size of school and number of film courses may be accounted for by factors of geography and employment-opportunity already mentioned. But even these additional factors do not explain the many courses at Baylor University and the few at Brooklyn College. Other matters—philosophy of curriculum, budget in comparison to enrollment—would no doubt have to be considered before the proportionate differences in number of courses offered by the 100 schools could be fully understood.

Catalogues revealed a wide range of emphases among the courses. In the main, however, the courses fell rather easily into four broad groups. Some were distinguishable by their primary concern with the instructional film used to convey information, develop skills, or provide motivation for study in various subject fields. These are grouped under the general head "Audio-Visual." A second group of courses emphasized writing, composing and acting for films and work in cinematography, editing and the like. These are grouped under "Film Production." The history and esthetics of film, and "motion picture appreciation," received greatest attention in a third group of courses. This category, labeled

[4] These 20 schools and their enrollments according to the *Education Directory, op. cit.*, were: New York University, 46,357; University of California, 39,492; City College of the City of New York, 33,203; Columbia University, 27,636; University of Illinois, 22,250; University of Minnesota, 22,080; Indiana University, 21,125; Ohio State University, 20,378; Northwestern University, 20,178; Wayne University, 19,307; University of Michigan, 18,912; Boston University, 18,797; University of Wisconsin, 18,357; University of Pennsylvania, 18,123; University of Pittsburgh, 17,484; Brooklyn College, 16,393; Syracuse University, 16,007; University of Texas, 15,355; University of Cincinnati, 14,938; Temple University 14,855.

"History, Criticism, Appreciation," also contains journalism courses in the writing of movie reviews, and music courses which include the study of film music. Courses listed under "Communication" are primarily concerned with film as one of the mass media reflecting and affecting society, and with the freedom and responsibility of an art-industry in disseminating ideas. Of these four approaches, the "Audio-Visual" was the most common, accounting for 39 percent of the film courses given by the 100 schools; "Production" was next (28 percent); then "History, Criticism, Appreciation" (17 percent); and last, "Communication" (16 percent).

Departments sponsoring film courses. Departments of education gave by far the most courses (38 percent). The other departments rank as follows: speech and drama (17 percent), motion pictures (12.3 percent), journalism (7.3 percent), communication (5 percent), library science (4 percent), sociology (3 percent), English (2.4 percent). The remaining offerings by departments of radio and television, photography, music, art, political science, marketing, psychology, and philosophy make up 11 percent of the total. Forty-two percent of the courses were for undergraduates; 34 percent were open to both undergraduates and graduates; 24 percent were for graduate students only. Table 2 provides a breakdown according to departmental sponsorship and level of the courses.

TABLE 2—FILM COURSES OF THE 100 LARGEST COLLEGES AND UNIVERSITIES, DURING 1952-1953, LISTED ACCORDING TO SPONSORING DEPARTMENT

Department	Level			
	Undergraduate	Undergraduate and Graduate	Graduate	Total
Education	37	98	82	217
Theater Arts, Dramatic Arts, Drama, Speech, Speech and Dramatic Art	64	25	8	97
Motion Pictures, Cinema, Films	35	19	17	71
Journalism	21	15	6	42
Communication(s), Communication Arts, Communications in Education	13	9	7	29
Library Science, Library Training, Library Service	6	8	10	24
Sociology, Social Relations	7	7	2	16
English	13	0	1	14

TABLE 2—Continued

Department	Level			
	Undergraduate	Undergraduate and Graduate	Graduate	Total
Radio and Television; Telecommunications; Radio, Television and Motion Pictures; Radio; Television	12	1	0	13
Photography, Photography and Film	9	2	2	13
Music	7	3	2	12
Fine Arts, Art	8	0	0	8
Political Science, Government	5	2	0	7
Marketing, Advertising, Publicity	3	2	0	5
Psychology	3	1	1	5
Philosophy	1	1	0	2
Total	244	193	138	575

Six department, though not motion picture departments, offered clusters of film courses. At Baylor University a Television and Films program had been offered in the Department of Drama since 1947; 10 courses presented an "application of dramatic methods to television and film production." The Institute of Design, Illinois Institute of Technology, offered seven courses dealing with film in its Photography and Film Section. At the University of Denver, the School of Theatre in the Division of Communication included four film courses. Similarly, at the University of Pittsburgh the Department of Speech gave four courses. At the University of Miami the Department of Radio, Television and Motion Pictures offered four two-semester courses, and at Los Angeles City College the Department of Drama had four courses.

Five departments, divisions, or institutes were devoted entirely to film: the Department of Cinema, Institute of the Arts, University of Southern California; the Motion Picture Division, Department of Theater Arts, University of California at Los Angeles; the Institute of Film Techniques, School of General Studies, City College of the City of New York; the Department of Motion Pictures, College of Arts and Science, New York University; and the Division of Motion Pictures, Photography and Visual Aids, School of Public Relations and Communications, Boston University.[5] The

[5] In Table 2, courses offered by the Motion Picture Division of U.C.L.A. are listed under "Theater Arts" since this is the official department title and the correlation of film with drama seems quite close. For similar reasons courses in the Division of Motion Pictures, Photography and Visual Aids at Boston University are listed under "Communication." As far as the extent and intensity of their offerings, they are as much motion picture departments as those at U.S.C., C.C.N.Y. and N.Y.U. which were listed under "Motion Pictures" because of their somewhat greater autonomy.

largest of these five departments, in terms of enrollment and number of courses, was the Department of Cinema, University of Southern California.

SOME IMPLICATIONS FOR THE FUTURE OF COURSES IN FILM

The general picture of college and university courses dealing with film is encouraging in terms of their widespread distribution, impressive number and variety, and the numerous departments sponsoring them. A great deal of attention is given to films as audio-visual materials. Audio-visual courses provide valuable assistance and encouragement in the use of film as a medium of instruction. There seems to be a sufficient number of technical courses and motion picture departments to meet demands of the industry for trained workers. In fact, concern for training in film making is second only to the audio-visual emphasis. But courses in the art, history, and social function of film are too infrequently offered to form part of many students' education in the contemporary arts.

First steps to be taken, if students generally are to develop critical appreciation of film, are the coordination of existing approaches and the sharpening of focus on the place of film in general education. Because of its numerous functions—teaching, persuading, selling, recording, entertaining—film becomes different things at different times to different people. Specialists in many areas have much to contribute to a total knowledge of film, owing to the composite nature of film form and the evident interaction between film audiences and film content. When the various aspects of film, and contributions of specialized knowledge by those in many departments, become correlated, a broad training in film can become part of a general education in the arts and concerns of modern culture. This is a responsibility American colleges and universities must meet in order to contribute effectively to the continuing development of film as a distinct and rich medium of art and communication.

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REPORTS IN BRIEF

This issue introduces a new feature, "Reports in Brief." Short articles, research studies and reports on methodological procedures will be published. They should be submitted to the Editor in the same form as full-scale articles and should not exceed 2000 words in length.

THE USE OF MOTION PICTURES IN PSYCHOLOGICAL RESEARCH

• EUGENE S. GOLLIN [1]

THERE are a number of psychological problems which might fruitfully be explored by the use of motion picture techniques. The decision to employ such techniques ought to be undertaken primarily in terms of their appropriateness for the research problem. Other factors such as time, availability of equipment, expense, and skills in preparation and production are bound to enter into decision making.

This report will be concerned with a particular research use of motion pictures where the problem dictated the selection of the method and the other factors did not preclude its employment.

The over-all research program is concerned with the specific question of how impressions of personality are formed, whether the ways in which they are formed relate to other kinds of behavior, and with the specific relationship of these subjective procedures to such variables as age, intelligence, and social background.

Most studies of the formation of personality impressions have been conducted by presenting subjects with trait-name lists purporting to represent some individual (e.g., 1, 6), or by having subjects react to a limited sampling of the behavior of some person present before them (5), or by reading descriptive paragraphs on which judgments might be based.

The inadequacy of trait-name lists and of paragraphs lies in their remoteness from the concrete circumstances under which

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impressions of personality are formed in daily life, the artificiality of the stimulus materials, the absence of a wide array of cues which necessarily enter into complex social judgment. The methodological shortcoming of presenting limited samples of the behavior of actual persons lies in the difficulty of replicating the behavior for groups of subjects. The "actor" would have to be presented against the same background, and it would be a precondition of experimental analysis that his behavior did not vary from presentation to presentation. This condition is obviously difficult to meet.

To a certain extent motion picture methods overcome the difficulties inherent in the techniques described above. The value of using a motion picture lies in the fact that precise control of the behavior of persons exposed to judgment can be achieved with minimal sacrifice of the richness and vividness of a real-life situation.

Three studies in this area have been completed utilizing silent motion picture techniques and a fourth is under way (2, 3, 4).

The first study employed adults as subjects. It was designed to discover the nature of impression formation when the person being judged was portrayed in a series of discrete and diverse behavioral activities. Motion picture presentation of the stimulus material was undertaken to correct the methodological shortcomings of earlier procedures. The motion picture consisted of five scenes. One person (a young woman), hereinafter called the star, is shown behaving in ways which suggest diverse character-qualities; two scenes are intended to connote promiscuity, two contain the connotation of kindness, and one is intended as neutral. Running time for the entire picture is four minutes. The scenes can be presented in a variety of orders, and under different sets of experimental instruction. Subjects, in this study, were requested to write their impressions of the personality of the star and then to respond to a modified social distance scale. Particular theoretical questions having to do with order of presentation and with the relationship between impression and scale response were explored. The main finding, however, was that in this controlled situation subjects differed with respect to the way in which they formed their impressions. Three major impression-formation techniques emerged in the course of analysis:

> Some subjects characterized the star in terms of both behavioral themes and attempted to relate the presence of these diverse behaviors in one person. The subjects, while characterizing the star in terms of both behavioral themes, did not in any way attempt to relate them. A third group of subjects wrote impressions which characterized the star in terms of only one behavioral theme; that is, she was considered to be either entirely immoral or an entirely "nice" person (2:66).

Presenting behavior via a silent motion picture yielded written impressions sufficiently elaborate to permit the analysis described in the foregoing quotation. This appears to be a distinct advance over the trait-name technique. The impressions obtained from subjects contain reference to facial expression, clothing, environmental surroundings, manner of walking, gesturing, and other facets of behavior which enter into the judgment of others. The methodological advantage of this enrichment for the investigation of social judgments of other kinds is apparent.

A second study was directed toward the question of the generality of behavior. The same motion picture was utilized. In addition subjects were presented with a concept-formation task. A relationship between manner of forming impressions and facility in concept formation was hypothesized. The predicted relationships were supported by the experimental findings (3).

A third study was conducted within the framework of developmental theory. It was hypothesized that certain of the individual differences manifest at the adult level would arise sequentially in the course of development. A new motion picture, starring a boy, was constructed. This movie consisted of four scenes. Two scenes portrayed the boy behaving in socially disapproved fashions; the other two scenes presented him in socially approved behaviors. The task of the subjects was to present their impressions of the boy. Subjects ranged in age from 8-0 through 17-11 years. Age related differences are forthcoming under the conditions of test.

The utility of this general method is demonstrated by the meaningful and consistent results that have so far been obtained. This technique can easily be modified to apply to a wide array of social psychological problems.

The film size in the adult study was 8 mm. Since then 16 mm films have been used. Both children and adults without previous acting experience have been able to serve adequately as actors. The films are amateurish in many respects but are, nonetheless, adequate for research requirements. Each of the films has been

produced with rented or borrowed equipment and costs in no case exceeded $150. This, of course, does not include research personnel whose participation makes such endeavors possible.

After working with these techniques for a number of years the writer is convinced of their methodological advantages. Much can be done to refine procedures beyond present crudity, and to build special procedures addressed to specific questions.

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AV PRODUCTION ACTIVITIES IN SCHOOL SYSTEMS

• JERROLD E. KEMP [1]

NEWER curriculum developments in American education are becoming more and more dependent on the availability of suitable instructional materials for classroom use. The demand for audio-visual materials has increased as educators have recognized the particular values which may be derived from their use.

Commercial concerns produce a large quantity of useful audio-visual materials, but these must be generalized for wide distribution. Only infrequently do such commercial materials serve the definite needs of a local situation. Both Corey (5) and Hoban (7)

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recognized this problem and suggested a need for materials which would be locally produced to serve specific school system, school, or individual teacher needs. These have been termed "locally produced materials" and it is with such materials that the writer was concerned.[2]

The purposes of this investigation were to determine the extent of local production of audio-visual materials, for classroom and other use, by schools and school systems of various sizes; to point out good practices; and to make recommendations for those interested in initiating such a program of local audio-visual production.

In order to accomplish these purposes it was necessary: (a) to determine the extent to which audio-visual production activities were taking place in public school systems throughout the country, and (b) to select active school systems and, by case study, examine and analyze each production program.

Procedure

The audio-visual representative in each state department of education was believed to be best acquainted with those school systems that were active in audio-visual production work in his own state. Replies to a brief letter were received from all 48 states with names of recommended active school systems. A single page questionnaire was then sent to the audio-visual director of each recommended school system inquiring as to: (a) the types and quantities of audio-visual materials produced in the school system, (b) the purposes served by these materials, and (c) the number of persons engaged in production work.

From among the school systems indicating outstanding production activity a pilot system and eight additional systems of various sizes in the North Central Association of Secondary Schools and Colleges were selected for intensive case study. An interview guide was used with administrative and supervisory personnel of the school system, the audio-visual director and members of the audio-visual department, school principals, audio-visual school coordinators, and teachers. Data were gathered bearing on the following aspects of local audio-visual production activities: (a) administrative organization of audio-visual services and re-

[2] This report is based on the author's doctoral thesis, "Audio-Visual Production Activities in Selected School Systems with Recommendations for Improvement." The study was completed at Indiana University in 1956.

lated production activities, (b) purposes served by local production, (c) personnel engaged in local production, (d) physical facilities for production, (e) equipment for production, (f) types of materials produced, (g) financial aspects of local production, (h) evaluation, by school personnel, of production activities, and (i) plans for further growth in local production activities.

Findings

The audio-visual representatives in the 48 state departments of education recommended 114 school systems as active in audio-visual production work. Questionnaires to the audio-visual director of each school system were returned by 102, or 89 percent of the 114 systems. Replies indicated that 36 school systems were actively engaged in producing materials. California led with eight active systems, Indiana reported four, Pennsylvania and Massachusetts listed three each, Iowa, Ohio, Kentucky, and Texas indicated two each, and 10 additional states each had a single active school system. Nine school systems in the North Central Association were selected for case study.

The three principal purposes served by local audio-visual production were: (a) for public relations, (b) for preparing instructional materials, and (c) for in-service training needs. The audio-visual directors spent between 5 percent and 20 percent of their time in preparing black and white photographs, 2x2 color slides, motion pictures, and radio programs. Assistants in production were employed in the three larger school systems. A few administrative and supervisory personnel engaged in a limited amount of production activity (mainly 2x2 color slides) in a majority of school systems. In all school systems some personnel, from high school principals to elementary school pupils, engaged in some formal production activity to fit local needs.

Five school systems had radio broadcasting studios, while in four systems photographic darkrooms were available in a central location. A graphics workroom and a display area for materials prepared were used in two school systems. Seven school systems reported darkrooms in one or more schools. Equipment for production consisted mainly of 35 millimeter still, four-by-five press, and 16 millimeter motion picture cameras. In addition, five school systems operated FM radio stations.

Two-by-two color slides led in materials produced in all nine school systems. Slides were generally prepared on community resources, school activities, and specially created projects. Eight school systems were active in motion picture production and radio programing. Photographs were of major importance in six school systems. Other materials produced in four or fewer school systems included: television programs, guides and manuals, filmstrips, mounted pictures, models, recordings, 3¼x4 slides, graphic materials, exhibits, and dioramas.

The total audio-visual materials budget for the nine school systems ranged from $5,700 to $42,663. From these budgets amounts ranging from $350 to $3,107 were provided for local production. A mean of 7.6 percent of a school system's audio-visual materials budget was used for production services.

In seven school systems the support given to the production program by the superintendent and the values of in-service training programs in production techniques were considered favorable in promoting growth of production activities. Four school systems considered the close relationship established with curriculum personnel in the school system and the good cooperation extended by community groups as influences favorable to the development of local production activities. A total of 22 plans were being considered by the nine school systems to increase and improve their audio-visual production activities. These ranged from the establishment of an educational television station in one system, to plans by five school systems to set up and equip workrooms for making inexpensive materials.

Conclusions

Among the conclusions resulting from this study were the following major ones:

1. All production programs, except that in the largest school system, were considered to be in a formative stage. Activity was taking place mainly in the central audio-visual and radio and television departments, as in a centralized program. A few directors were planning to expand production facilities into the schools by establishing workrooms for interested faculties to prepare inexpensive materials.

2. In practically all school systems the original impetus for initiating production work was due to the support of the superin-

tendent. As a result, a large portion of production activity was devoted to informing the public of school matters. Most audio-visual directors, through their own interests and efforts, have been able to start serving other major purposes; namely, preparing materials, along with curriculum supervisors, for in-service teacher education, and instructional materials for direct classroom use.

3. School system size, as based upon pupil enrolment, was not a major factor in fostering or limiting the extent of production activities. In some school systems activity was concentrated on a few phases of production work (such as radio programing), while in others activity encompassed the total range of materials noted.

4. Two-by-two color slides received the greatest emphasis in local production. Teachers were frequently encouraged to prepare slides and to maintain their own file of slides to fit their own teaching needs. In addition, the motion picture production undertaken in many school systems, and the high quality of most films, attested to the fact that this medium has a definite place in serving major local needs.

5. There was a definite realization of the values inherent in local production activities to personnel on all levels in each school system. Enthusiasm for specific production activities, resulting materials, and final outcomes of using such locally prepared materials was continually noted. Such results as community awareness followed by desirable action relative to school problems, contributions to the improvement and pleasure of teaching, and facilitation of learning by pupils justified the time, effort, and expense needed to prepare specific materials to serve specific needs.

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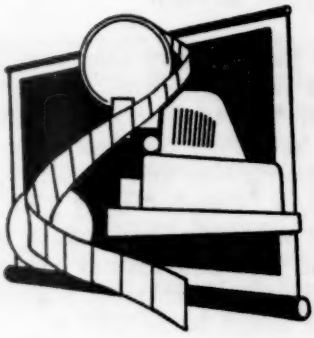

FILM

• ROBERT W. WAGNER

THE TRAINING OF PROFESSIONAL FILM WORKERS IN EUROPE

WHAT the technical, artistic, and communicative qualities of the motion picture will be 20 years from now may well depend upon what is happening in a dozen or more schools and institutes in various parts of the world where hundreds of young film makers are being trained today.

In the United States, colleges and universities have been slowly expanding their programs for the training of both professional and nonprofessional film makers,[1] although Hollywood has only recently become seriously interested in professional training of film workers at the university level.[2]

In Europe, state schools of cinema have been in operation for some years, and professional training in motion picture production has become a matter of national concern. The impetus for such training on the Continent came somewhat earlier than in our country for several reasons.

First, while in the United States, pioneers like Griffith and Chaplin were making film history, Europeans like Pudovkin and Rotha were also writing about it, building a set of classic principles which could be transmitted, developing a "language of film" which could be effectively taught. While the entire energies of American film producers were going into production, a group of European film makers like L'Herbier in France, Eisenstein in the Soviet

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[1] Ellis, Jack. "Film Courses in U.S. Colleges and Universities." *Audio-Visual Communication Review*. Winter, 1956.

[2] Major studios are presently working actively with the Department of Cinema at the University of Southern California, and the Department of Theatre-Arts at the University of California at Los Angeles, to extend existing training programs. *Variety* (May 23, 1956) reported that studios are planning to open their doors to cinema students whose work would be graded by studio executives. Mervyn LeRoy last year called for 50 to 75 new technicians annually from major colleges, and the Society of Motion Picture and Television Engineers has organized a committee to work on the problem of technical education at the university level to meet the growing need in both the film and television industries.

Union, Chiarini in Italy, and Toeplitz in Poland, were also providing leadership in the training of young people. While, until recently, Hollywood and the American public looked upon film simply as a form of entertainment, Europeans have long been concerned with the collection and preservation of film classics and the serious study of the motion picture as an art form. Because many European film makers were also teachers and writers as well, much of our written knowledge of film technique and film history comes from abroad, and forms the basis of film theory in most schools of cinema today.

Second, the necessity of meeting foreign competition stimulated the development of cinema schools as talent pools to strengthen the national industry. Even with import restrictions and quotas set by certain countries, the competition, especially with American films, has been severe. For example, about 40% to 50% of the gross of all U. S.-produced films presently comes from the export market. The fact that many of the better producers, directors, and artists of Europe, attracted by the magnetism of Hollywood, were continually being drained away, made the encouragement of local talent for the local industry essential.

Third, political expediency dictated that this powerful medium of communication be used in the interests of the state, both as a calculated method of educating and informing the home audience, and as a medium for presenting the national face to the world. State schools of cinema were set up as an integral part of the complete or partial nationalization of the film industry itself.

These three factors, in various degrees and combinations, seem to be responsible for the kinds of cinema schools and institutes presently in operation in France, Italy, Spain, the Soviet Union, Poland, Hungary, Czechoslovakia, and West Germany. All three are also operated in China, Egypt, Roumania, Japan, India, Greece, Brazil, and Iran, where motion picture training centers are reported in various stages of development.[3]

The Soviet government, which took control of the Russian film industry in 1919, founded the film training center which, in 1922, became the State Institute of Cinema in Moscow. Technical schools for the training of motion picture engineers, projectionists, and technicians were later established at Leningrad and Kiev. Similarly, the Mussolini government took over the film industry of

[3] There is no school of cinema as such in England, although both the University of London, and Bristol University offer courses in motion pictures, and the British Film Institute conducts a summer course for teachers which includes work in film production. The traditional training ground for young British film makers has been the "documentary school," represented in its early stages by the G.P.O. and Crown Film Units, and in its later stages by the Colonial Film Unit and "Group 3" under the direction of John Grierson All of these units have been discontinued.

Italy in 1935, and established a state school of cinema which was reorganized in 1948, under the Ministry of Culture as the Centro Sperimentale di Cinematografia, in Rome.

The French national cinema school, the Institut Des Hautes Etudes Cinématographiques (IDHEC), was opened in Paris in 1943, under the aegis of the Ministry of Industry and Commerce, and the Centre National de la Cinématographie, an agency established by law in 1946, which controls the production, distribution, import, and export of film as well as the training of technicians.

A Faculty of Films was established in the Academy of Arts, in Prague, Czechoslavakia, in 1945. In 1947, the Ministry of Education established the Institute de Investigaciones y Esperiencias Cinematograficas in Madrid, Spain, under the Office of Cinema and Theatre, which is, in turn, a part of the Ministry of Information and Tourism. The Polish School of Cinema (Panstwowa Wyzsza Szkola Filmowa) was opened in Lodz in 1948 under Film Polski, controlled by the Ministry of Culture and Fine Arts.

These and other European schools, such as the Deutsches Institut Für Film Und Fernsehen, in Munich, West Germany, developed training programs according to the needs of the national industry. In Spain, for example, although the curriculum includes direction, production, and art direction, the lack of technical workers in the Spanish industry put the emphasis on instruction in laboratory practice, sensitometry, optics, photography, acoustics, and sound recording. In France, on the other hand, the emphasis has been on advanced training in the creative aspects of cinema, including direction, production, editing, script preparation, scene design, costume design, sound, and camera operation. Actors are trained in separate schools of drama, of which there are many in Paris.

Although it is reported that a technical course for motion picture engineers has recently been created in Rome, the Centro Sperimentale stresses the creative side of production, such as film acting, direction, set and costume design, editing, and scenario writing. As mentioned earlier, the Film Institute at Moscow is concerned with the education of producers, directors, set designers, editors, scenarists, and administrators, while separate schools at Leningrad and Kiev train motion picture engineers and technicians.

The length of training varies from school to school, and specialty to specialty. IDHEC, in Paris, and the Centro Sperimentale, in Rome, for example, have two-year courses. The Institute in Madrid has a three-year course. The Polish school at Lodz, has a four-year curiculum with a fifth year which includes the production

of a thesis film and work in the studios. The Institute at Moscow also has a five-year course, although the curriculum for film actors is only two to three years.

Tuition is free for nationals, in the schools of Italy, Spain, Poland, the U.S.S.R., Hungary, and Czechoslavakia. French students pay an examination fee of 3,000 francs (about $10) at IDHEC. At the Institute at Moscow and the Polish school at Lodz, living quarters are provided for students. Living allowances in the amount of 30,000 lira (about $35), per month are provided by the Centro Sperimentale, for students whose homes are in Rome, and 50,000 lira (about $55), if they come from other parts of Italy.

The number of young people applying for admission to these schools is high, and entrance requirements include both educational prerequisites and competitive examinations which vary with the field of specialization. Students of film acting, for example, are admitted at the age of 16 to 18 in the Italian, Russian, and Spanish schools, and in most cases, no more than the equivalent of a high school education is required. Students of cinematography are generally expected to have previous training in engineering, optics, or photography. Camera operators studying at IDHEC, for example, must have finished their work at the School of Photography and Cinematography (École Technique de Photographie et de Cinématographie), which is under the supervision of the Ministry of Education. Students of art direction are generally required to have previous training in architecture, or a degree from a school of fine arts. The equivalent of a bachelor's degree is required of students of direction and production in France, Italy, and Spain.

The Institute at Moscow probably has between 700 and 800 students, but with this number appears to be working under considerable handicaps of space, equipment, and materials.[4] The Centro Sperimentale, in Rome, accepts about 30 students each year, with a total of possibly 90 students enrolled in the various branches of study. The Polish school in Lodz, has a reported enrollment of 140. Some 450 students have been accepted in the Spanish school since its opening in 1947, and since 1954, more than 50 have completed the course. There were about 40 first-year, and 30 second-year students at IDHEC in 1956. The West German school in Munich probably has 30 to 40 students. The importance of these young people, of course, is not in their numbers, nor even

[4] In an open letter appearing in the *Komosolskaya Pravda* (April 13, 1956), students of the Institute complain: ". . . Only half of the directors who were graduated this year (1956) had a chance to shoot even one meter of film during the five years. . . . In 1939 it was decided to construct a training building in the Institute (the Institute occupies a part of the area which belongs to the Gorky Studio). This building has been under construction for 17 years and is still not finished, and only 35% of the area is usable. It is enough to say that the Institute has not even a screening room."

in the possibility that among them there may be a Flaherty, a Rosselini, or a Cocteau. Rather, it would seem to be in the fact that whatever their film job, and whatever their talents, all may one day be in a position to make a great many people laugh, or cry—or think.

Foreign students are found in all the cinema schools of Europe. Conditions of their admission vary, and they do not generally enjoy all the benefits and privileges of the native student. Foreigners at IDHEC, for example, must agree not to seek employment in France following graduation, and matriculation fees are charged in the amount of 90,000 francs, or about $250 a year. Between 1944 and 1956 students from more than 40 countries have studied at IDHEC. More than 20 nationalities have been represented in the Spanish school, most of them coming from Latin America. The Italian school has also had a considerable number of foreign students, notably from Spain, Egypt, and France. In 1956, Poland extended an open invitation for advanced students of direction to study at the school at Lodz and to produce films on Polish themes. While the Institute at Moscow has not encouraged students from outside the Soviet orbit, more than 30 nationalities inside the U.S.S.R. are represented.

It is virtually impossible for a young European to get into the motion picture industry of his country without going through the national school of cinema. Following the completion of his course of study, his employment seems to hinge upon the quality of his "thesis film," but to a larger degree upon the needs of the industry as determined by the trade unions, such as the Syndicate des Technicians de la Production Cinématographique in France, and the Unione Nazionale Producttorie Film, in Italy.

The proximity of the European schools has facilitated the interchange of ideas. The Italian, French, and Russian schools have served as models for other training centers. The Polish school at Lodz, for example, is patterned largely after the Institute at Moscow, and the staff of the West German school in Munich includes two graduates of IDHEC. The exchange of students, visiting faculty, and lecturers, and the numerous international film festivals such as those at Cannes, Edinburgh, and Venice, have created a lively transfer of information on professional training of film workers in Europe. This exchange was crystallized when, upon the invitation of the French government, and upon the initiative of Marcel L'Herbier, President, and Rémy Tessonneau, Administrator-General of IDHEC, a meeting of representatives of

schools of cinema was organized on the occasion of the Cannes Film Festival of 1954.

This group, first known as the International Congress of Schools of Cinema, and later as the International Congress of Schools of Cinema and Television, met again in 1955, and twice in 1956. Its stated purpose is to bring about a closer liaison between cinema schools all over the world through the exchange of documents, films, curricula, and other information. The organization has also discussed problems involved in the exchange of students and teachers, and is working on an international dictionary of motion picture terms.

The United States was represented at the 1955 and 1956 meetings of the Congress by the University Film Producers Association, which includes producers and teachers of film from more than 70 American colleges and universities.[5] The pattern of training in this country, although scattered, opens up to the student a variety of professional approaches, including educational, documentary, industrial, scientific, and television film production. At the same time, the availability of 16 mm film and equipment has put the tools and materials of film making into more hands than ever before, and has increased the ranks of the "self-taught."

In Europe, on the other hand, the patterns of training are more standardized. The paucity of 16 mm film stock, and equipment, and restrictions on the means of production and exhibition, have largely confined serious film making to the 35 mm theatrical field. European television does not yet consume more than a fraction of the film devoured by American television. As a result, while many good films come out of Europe, many good film makers find it difficult to command the means to express themselves in an expensive medium, and to do this with the degree of freedom found in the United States.

In spite of difficulties and handicaps, young people, in Europe and elsewhere, continue to be attracted to the motion picture, and to the schools and institutes which offer professional training and the promise of a chance to work in this medium.

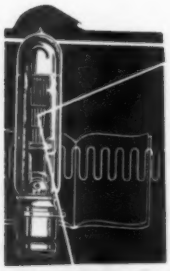
There was a time when some motion picture producers, like some journalists, belittled the idea that motion picture making or newspaper writing could be "taught" at all. Although nobody ever said that either of these businesses could be "learned," it seemed to be denied that they could ever be learned in an organized, logical, and reflective way. The history of cinema education in Europe,

[5] Through its International Relations Committee, the U.F.P.A is maintaining liaison with the International Congress of Schools of Cinema and Television, and has cooperated with the U.S. Information Service in the overseas film program of the Department of State.

and the growing needs in the American film industry make self-evident both the necessity and the practicability of such training today.

That this instruction must include much more than technical know-how is obvious. A broad, humanistic basis must be provided for the film maker of tomorrow, whether he be director, producer, cameraman, editor, actor, or technician. The student must be encouraged to try new approaches, stimulated to experiment. And he must be given the means to do so. Above all, if he is expected to bring a little truth and beauty to the screen, he must be free of restricting ideologies which censor creativity and inhibit independent thought. The film maker himself must be a free, intelligent, and responsible human being if the films of the future are to exhibit these qualities.

The idea of professional training in the whole field of audio-visual communication is gaining momentum. If mass communication is the means by which societies are brought together or kept apart, then the education of the mass communicator is of paramount importance. It would seem that we should begin to study the nature and development of the "story tellers of the mass media," as Reisman calls them. The time has come to be concerned with *who* says what to whom.



CURRENT DEVELOPMENTS IN COMMUNICATION

Editorial note: *In the somewhat inchoate but vigorously growing field of communications there is need for a continuing exchange of information and ideas among those who are carrying on research and/or developing programs of professional training. This need is met only in part by published books, articles, and completed research studies, all of which have limitations as methods of reporting on developments in progress. Face-to-face conferences help, but occur far too infrequently to enable geographically separated individuals and institutions to keep abreast of the many current developments. With this problem in mind, the editors of AVCR offer a new department, to be called CURRENT DEVELOPMENTS IN COMMUNICATION. This feature is initiated with the following report, and will continue in future issues if it is found to be useful to readers, and workable from an editorial standpoint.*

Contributions to the department are solicited from educational institutions, government agencies, industrial and other organizations. They should be sent to the Departmental Editor,

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COMMUNICATION PROGRAMS IN HIGHER EDUCATION

(Notes on a conference conducted during the 1956 convention of the Department of Audio-Visual Instruction of the National Education Association, March 13, 14, 15 in Detroit, Michigan)*

Report submitted by:

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School of Public Relations and Communications

MALCOLM S. MacLEAN, JR.
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* *Conference Participants:* Roger Albright, Education, Motion Picture Association of America; Ward E. Ankrum, Communications, Stephens College; Melvin Brodshaug, Public Relations and Communications, Boston University; Floyde E. Brooker, Executive Secretary, DAVI, NEA; Mrs. Dorothy Chapman, University of Southern California; A. J. Foy Cross, Education, New York University; Irene F. Cypher, Education, New York University; Edgar Dale, Education, Ohio State University; James D. Finn, Education, University of Southern California; R. S. Hadsell, Audio-Visual, Syracuse University; Herbert Jensen, Petroleum Institute of America; Donald Lloyd, English, Wayne University; Malcolm S. MacLean, Jr., Journalism, University of Wisconsin; Col. John E. May, United States Air Force; Bruce Mahan, Dean, Extension Division, State University of Iowa; Floyd Reeves, Administrative Consultant, Michigan State University; Mrs. Dorothy Reynolds, Chicago Historical Society; Gordon A. Sabine, Communication Arts, Michigan State University; Charles Schuller, Audio-Visual, Michigan State University; Violet Wuerfel, Dearborn Public Schools.

Why, Who, and What?

As part of its 1956 convention in Detroit, the Department of Audio-Visual Instruction (DAVI) of the National Education Association (NEA) sponsored three meetings dealing with "Communications Programs in Higher Education."

These meetings attracted teachers and administrators and research people from the disciplines of audio-visual instruction, journalism, education, administration, public relations, communications, speech and English.

Floyde E. Brooker, executive secretary of the DAVI, and Professor James D. Finn (University of Southern California) played central roles in directing the attention of DAVI members toward the broad concept of communication. Along with others, they were concerned about where present developments of communications programs might lead and the part to be played in them by audio-visual instruction and services.

Brooker said:

> Primarily the purpose of the sessions is to consider the problem of the various divisions of communications which are developing in colleges and universities. What is the purpose of such administrative divisions? What should they include? How should they be organized? And what should be their content? Some of us believe that these divisions of communications have arisen in some instances from the general feeling that this is the "popular new thing" in higher education and that these divisions include many areas of subject matter which has frankly not changed one whit from its previous status.

Dean Gordon A. Sabine, College of Communication Arts, Michigan State University, set the tone of the sessions with these remarks:

> 1. There are a dozen or so departments and divisions and schools with the word communication or communications in their titles—yet no two of them appear to be doing anything like the same thing.
>
> 2. We have organized curricula in communications, but we have not yet identified what it is that will be our unique body of subject matter.
>
> 3. We have only the barest scattering of human beings broadly trained in communications, but from too many institutions over the nation we hear rumblings about new schools and departments of communications, to be organized not because there are highly skilled leaders in the field but because there is apparently some social virtue in being on the bandwagon—even though one has no ticket and even though neither passenger nor driver knows where this particular bandwagon is headed.
>
> . . . we must proceed with caution and with our eyes open and with the integrity that guarantees we are not foisting a fraud upon the society, the student, or ourselves.

One of the concrete purposes of the meetings was to decide whether to propose a survey of existing communications programs.

What Do We Mean by Communication?

Defining and describing communication might help to clarify possible organizational lines. Malcolm S. MacLean, Jr. (University of Wisconsin, journalism), suggested the following definition:

Simply, communication means A conveying information and/or feeling about something to B with consequent reaction in B. (A and B can be people, animals, parts of animals, individuals or groups.)

Such a general definition would include anything from a viewer reacting to a Picasso painting or a listener responding to a Hindemith quintet to the most minute electro-chemical stimulus-response interaction within a person's body. This further suggests chains of communication in the form: A——BA——BA——BA——B, etc., where the message receiver (B) becomes the message sender, (A), where the "same" message is conveyed along the chain usually with some change in form or content at each BA point. The situation of a two-person conversation would be a special case of closure of the chain so that: $\begin{matrix} B——A \\ A——B. \end{matrix}$ Overt signs of reaction to a message are in themselves a message, often called "feedback."

Dean Melvin Brodshaug (Boston University School of Public Relations and Communications) said that MacLean's general definition needed to be narrowed to aid in setting up organizational lines. Practically speaking, colleges or schools or divisions of communications could not and would not want to teach music and painting and architecture—the fine arts generally.

Such schools, Brodshaug said, would deal mainly with the information and enlightenment aspects of communications. Of course, use of various art forms would be involved in conveying messages, especially in respect to attempts to obtain attitude change. Brodshaug pointed out that we are chiefly concerned about communication which increases knowledge, changes attitudes, and leads to action.

It was recognized, too, that art and music and various nonverbal systems as well as neurological chains must be considered in thinking about basic forms of communication. The broader concept of communication may be especially important in communication theory and research. These, in turn, tend to be fundamental to planning, teaching and administration as well as practice in the communications area.

Brodshaug defined these three levels of communication:

1. Person to person, or the small group situation where any one member may become the communicator at almost any instant.

2. The large audience situation, whether it is in an auditorium or a mass meeting with the aid of loud speakers, but where a single individual is addressing a large audience, and where the only response of the audience is a group response.

3. A strictly mass communication situation in which an individual instantly communicates with the vast and widely scattered audience, as by radio and television, or over a protracted period of time, as with newspapers, magazines and motion pictures.

Early in the first meeting, Edgar Dale (Ohio State University) focused our attention on the question:

What Do We Want to Produce through Communication Programs?

Dale suggested that several of the new communication programs, especially at the doctoral level, seemed to aim at producing a kind of "communication expert." This would be a person generally versed in the methodologies and substances of the social sciences, yet with more specific training in the professional skills and problems of the mass media. The communication expert could conduct communication research and help to develop theory. He could teach. He could also advise media professionals, basing his advice on available research in many areas and on his understanding of general communication problems and specific media problems. Dale asked what a graduate student can get in some of the programs now in operation.

MacLean described the Wisconsin interdepartmental Ph.D. in mass communications. He said the program is still very flexible. A student discusses his goals, generally in the area of teaching and research in communication, with a doctoral adviser in the school of journalism or the department of agricultural journalism. His adviser must first decide that his goals cannot be met better by one of the traditional Ph.D. programs of, say, a major in political science with a double minor in journalism. Then the adviser recommends to the graduate dean a committee for the student with members from the various disciplines closest to the interest of the student. MacLean said his own doctoral committee consisted of professors of journalism, sociology, political science, rural sociology, agricultural journalism, and education.

With the help of his adviser and the committee the student selects those courses most likely to contribute to the student's professional goals. Though no courses are "required" as yet, every student in the program has been advised to take some courses in statistics and research methods. Most students who take this doctorate have had professional training in journalism. So the courses in journalism can be confined to those dealing with communication

theory and research. Social psychology is stressed. A student planning a career in communication research would go on to more advanced statistics than one planning to become a teacher.

The interdepartmental committee at Wisconsin gives the student both written and oral preliminary exams. For the written exam, the committee presents the student with one large problem or sevaral smaller problems, "solution" of which will draw heavily on all areas of the student's training. The student is given one week in which to write not more than 25 double-spaced typed pages using whatever books he wishes but not discussing the problem with anyone. During the oral exam, committee members ask the student questions on basic communication concepts. The student must also qualify in "reading knowledge" of two foreign languages.

The Wisconsin communication doctoral candidate then writes a dissertation which must be a "substantial contribution" to the body of communication research, and research method and substance are judged by the committee. Sabine said that the College of Communication Arts at Michigan State University was then getting approval of a doctorate in speech and was working out a Ph.D. in communication. Seminars in communication research methods, theory and communication arts are to form a core of training surrounded by thorough grounding in social science research and substance drawn from departments outside the college.

The interdepartmental Ph. D. in Mass Communication Research offered by Stanford University was illustrated by the following study list of a recent candidate:

Methods of Social Research, Measurement of Attitudes, Measurement of Personality, Media and Opinion Measurement, Learning and Perception, Learning and Perception Laboratory, Social Psychology, Social Organization, Personality, Abnormal Psychology, Group Dynamics, * Communication and Persuasion, * The Media of Mass Communications, * International Communications, * History of Anglo-American Journalism, Mass Behavior, Statistics, including correlation, analysis of variance, factor analysis, and * sampling from human populations.**

Brodshaug pointed out the need for a place in the communication program for the noncommunication specialist. He said that Boston University's School of Public Relations and Communications does not grant the Ph.D. In its undergraduate and masters programs, however, it presents a core of communication theory

* Courses offered by the Department of Communication and Journalism, Stanford.
** See Chilton R. Bush, "Journalism Research and Research Training Programs in the USA," Gazette (International Journal of the Science of the Press) 1:243-47.

and practice and, in the school itself, teaches applications of various social sciences to communications.

Floyd Reeves, consultant to the president of Michigan State University, suggested that a good deal of integration may be necessary. He questioned whether most students, even at the doctoral level, were able to make all the pieces (courses) we offer them fit together into a meaningful system. He described the development of other disciplines—public administration, social work and business administration—where courses were added and split into new courses until the student found it almost impossible to chart a sensible way through the maze. Reeves warned against allowing the same thing to happen in the communication area. Pressure to split and add often comes from the people who hire our graduates. This employer wants a certain special training included. Another favors hiring graduates with another special skill. And so it goes.

Edgar Dale asked whether we need formal courses for many of the things we teach. When we are talking about developing a program, why talk only in terms of including this course or that? Can't we be creative? Can't we work out more effective devices than the course structure for giving our students educational experience?

Dale said most of his students had seemed to derive a great deal of benefit from producing things that were really useful, from doing things which they felt were important in the "real" world. Some of the informal arrangements of teachers and students working together often seemed to produce better results than the traditional course approach, Dale said.

Ward E. Ankrum, director of the communications program at Stephens College, a junior college for girls, described their general education communication skills setup. He said that at Stephens they work with the girls on reading, writing, speaking, looking and listening. He noted that some students were unhappy about the de-emphasis of writing, because they felt writing skills to be especially important for advanced college work.

It was suggested that a distinction ought to be made between those programs aimed at developing skills in personal communication and those aimed at developing skills for professional communication. In a sense, everybody needs personal communication skills.

Sabine said that Michigan State University has a basic program at the junior college level in communication skills (personal) separate from the professional training which is offered by the

College of Communication Arts. He and others felt that discussion should center on development of programs for training in professional communication.

Generalization and Specialization

Sabine suggested that the product of a communication program certainly needs a thorough understanding of how communication works. He needs, too, to learn the special skills that jobs in the various media demand. He must become well grounded, develop much more than surface knowledge, in the broad fields underlying the specific things he will likely communicate about. He needs a firm grasp of the ethics, role prescriptions and traditions of the professional area he expects to move into. He must learn to see how various forms of professional communication fit into the larger social matrix.

Donald J. Lloyd (Wayne University Department of English) said that no communication program could be worth much without considerable study of language—especially the English language in our case. But not the way language is taught today in the typical freshman English course. Lloyd outlined some new techniques in the teaching of language, techniques derived from research done by Hall and Trager in the analysis of culture for the Foreign Service Institute in the State Department. He mentioned a new book, written by himself and Harry R. Warfel, *American English in Its Cultural Setting*. Rather than the approach which asks the student to write papers and then punishes him for making "mistakes," Lloyd said, they used a more constructive approach which begins by giving the student some understanding of language, of things like morpheme units and syntactic patterns. Most present teaching of writing tends to destroy a student's feeling for the natural spoken language of his childhood. The new approach asks students to build sentences deliberately to a pattern, moving from very simple patterns to relatively complicated ones. Lloyd emphasized the mass of information about language in these areas:

1. Linguistic geography
2. Language operations in communication
3. Oral skills in sending patterns
4. Skill of sound patterns.

"Parsing sentences—one commonly used technique for language study—is like dissecting a dead body," Lloyd said. "It's like taking apart a wristwatch with an automobile kit."

Lloyd added that he felt that training in skills might well come

last rather than first as it often does now. On the other hand, MacLean noted that Wisconsin journalism students appear to enjoy and derive motivation from "getting right into things," playing the reporter role and writing stories in their first major journalism course.

Col. John E. May (U. S. Air Force) asked the group what might go to make up an undergraduate program in communication.

Dale suggested that such a program should certainly involve work in the areas of political science, economics, psychology, language and foreign languages. He mentioned Ohio State's Institute of Vision as an example of how interdisciplinary programs might be arranged. The Institute's work is based mainly in psychology and medicine, and closely related to the Child Guidance Center.

MacLean said that a program in Industrial Relations had recently been developed at the University of Wisconsin. The program was set up by an interdisciplinary committee, with major leadership coming from Economics. An undergraduate or graduate can work out a program, drawing on offerings in Economics, Political Science, Psychology, Sociology, Engineering, Law, Commerce, Education, Journalism and Social Work.

A. J. Foy Cross (New York University) said that NYU has what they call a communications arts group, in which every student takes the core art of communication course but then has some leeway in selecting other work. He said that teaching critical judgment of mass media products was one of the major aims of the program.

Services, Training and Research

The group talked about interrelationships among services, training and research in communication. Should the communication program in a university include the operation of radio and television stations, the distribution of audio-visual aids, handling of theaters for dramatic productions, the printing of a newspaper, etc.?

Sabine saw some important advantages to the College of Communication Arts in not being responsible for such service functions. He said:

> The man who teaches students skills in television or radio techniques shouldn't also have to worry about keeping air time filled up with programs. However, we do have a good working relationship with the operations people so that we can provide our students with experience in using the various media.

It was suggested that research is basic to a communication program. Fundamental research which helps to test and develop

communication theory can feed back into our general fund of knowledge about the processes and effects of communication. It can aid greatly in the selection and organization of techniques for effective communication. Results from communication research, it was felt, should be fed continually into both teaching and operations.

Roger Albright said we need research on reasons why an individual wants to communicate and also on why institutions want to communicate.

The question came up as to the reasons why business men fail to communicate effectively, with reference to the book, *Is Anybody Listening?* Brodshaug suggested that they do communicate very often in ways other than verbal or in ways that are not common in strictly educational situations. "A perfectly silent person can often be very communicative," Brodshaug said.

Hadsell commented that psychological research is contributing greatly to progress in communication. Lloyd mentioned the work of Ray L. Birdwhistell on kinesics.

It was noted that we in communication borrow some of our theory, research results and methods, and content or substance from many disciplines. This is because we are dealing with an important aspect of human social behavior. It is also because things to be communicated about are infinite. So, contributions to knowledge about and for communications come from all sides. Communication is a focus. Communication programs are probably aimed chiefly at helping a student to learn how to communicate personally and with the aid of mediating devices. He is sent, too, through other disciplines so that he will understand more of what he is communicating about.

One might consider a plan something like this for factors in communication education and research:

General Factors	*Special Factors*	*Examples*
How to communicate (Underlying theory of process)	Media and other skills and techniques for creators and performers, language, learning theory motivation.	Technique training in creative writing, reporting, photography, public speaking, television production, etc.
Understanding what is communicated (Knowledge of environment)	Substance of social and natural sciences.	Political science, economics, sociology, psychology, biology, chemistry, physics, etc.
Social-historical matrix (Institutional and time-binding aspects of communication activity)	Where various institutions dealing with communication fit, in development through time and in relationship to other institutions.	History of the press, laws, rights, economic support, criticism, responsibility, ethics, role prescriptions, regulation, social effects, etc.

General Factors	*Special Factors*	*Examples*
How to learn more about communication (Theory development)	Research methods in the various social sciences.	Experimental method, survey research techniques, opinion and attitude measurement, testing, statistical analysis, media measurement tools, etc.

It was suggested that the communication operations units—radio and television stations, publications, film production centers—whether on campus or off, can help to provide not only the opportunities for media experience mentioned above, but also vital facilities for research experiments.

Recommendations

The following recommendations grew out of the Detroit meeting on "Communications Programs in Higher Education":

1. The interested participants in these sessions should consider themselves members of a continuing committee for the development of professional communications programs in institutions of higher learning.

2. A separate committee or subcommittee might be formed for the development of programs in the communication skills area.

3. Joint committees should be arranged with various other professional associations concerned with the communication area—journalism, speech, English, etc. Also with the Association of Higher Education, American Council on Education, and other departments (than DAVI) of the National Education Association. Also possibly with the communication oriented people in professional associations of sociology, psychology and public opinion research.

4. An exploratory study of existing programs in professional communication is proposed. It is suggested that a survey could first be conducted by mail. Then a team from the committee could visit those institutions where communications programs are most advanced or seem to show the most promise. Results from this work could be distributed to key people in the area who would be asked then to use the previous work as a starting point and to outline "ideal" programs, with some discussion of the theoretical bases for the things they suggest. Such suggestions could lead to a conference in which these key people could help each other to work out practical steps toward effective communication programs. A proposal for funds for the above should be prepared immediately.

5. Some kind of clearinghouse should be set up to keep university administrators informed on what is developing in this area.

BOOK REVIEWS

KATZ, ELIHU, and **LAZARSFELD, PAUL F.** *Personal Influence; The Part Played by People in the Flow of Mass Communications.* Glencoe, Illinois: The Free Press, 1955. 400 p.

Reviewed by
• **GEORGE GERBNER**

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"Between consciousness and existence," wrote C. Wright Mills in *White Collar,* "stand communications, which influence such consciousness as men have of their existence." Just how that happens is the fundamental problem of communication research as a social science.

This book makes a substantial contribution to our approach to that fundamental problem. It is a report of studies conducted under the sponsorship of Columbia University's Bureau of Applied Social Research, and the second volume in the series, Foundations of Communications Research. (The first was Bernard Berelson's *Content Analysis.*)

The appearance of this work in 1955 marked the official recognition in the field of communication research of a "discovery" at once so obvious that it is easily missed, and so troublesome in its research implications that it can be conveniently ignored in the search for "facts." Yet this "discovery" marks the distinction between that atomized and randomized conglomeration of "facts" so often dealt with in mass communication research—and the facts of life. It marks the distinction between the "steamroller" or "conveyor-belt" or "wholesaler-retailer" theories of mass communication and the conception which attempts to discern, between content and presumed effects, the specific role of that critical "intervening variable"—people.

The "steamroller" theory engendered the illusion of universal enlightenment (or degradation). The "conveyor-belt" theory en-

visaged an unbroken, one-dimensional flow of influence. The "wholesaler-retailer" theory specified a two-step process, but still saw mass communication funneled in bulk to its devotees, and, dispensed by them in smaller amounts to other-directed comrades, percolating, basically unchanged, down to the grass roots.

The trouble with these and other similar theories is not that they overstate the case. Indeed, one might argue that the inclusion of people as "intervening variables" allows for their functioning as relay stations in a communication network capable of boosting "effects" in their immediate environment. Nor does the difficulty rest in stressing one direction of the flow of mass communication—from producer to consumer—more than the relatively, and perhaps necessarily, feeble "feedback." The trouble is that the streamlined theories, in their preoccupation with short-circuited stimulus-response type "effectiveness" and its projection to hypothetical multitudes, miss the point of the case: the primary-group structure of human consciousness and influence in real-life social settings.

A study of how individuals communicate in their primary groups, and of how they function as relay points in the network of mass communication, brings into focus the *specific patterns* of mass media influence, exposure, and impact. It also points the way to an exploration of uses and transformations of media content serving group needs and functions. Its lesson is plain:

> No longer can mass media research be content with a random sample of disconnected individuals as respondents. Respondents must be studied within the context of the group or groups to which they belong or which they have "in mind"—thus, which may influence them—in their formation of opinions, attitudes or decisions, and in their rejection or acceptance of mass media in influence-attempts. (p. 131)

In their everyday lives people do not "respond" to the "stimuli" of communication in a laboratory sense. They *use their perceptions* of mass media content. Their uses of mass media content are not controlled entirely either by the nature of the "stimulus" or by their own predispositions as individuals. These uses appear to be largely functions of interpersonal relationships; they seem to be rooted in social groupings and processes which, indeed, define for the individual his patterns of action and his realities of existence.

This book is in two parts. The second part, which came first in the research sequence reported here, presents the results of a field study designed to trace the flow of influence in four specific areas of decision-making. From the findings of this study it

became clear that mass media influence was neither funneled nor transmitted in a simple fashion, and that theories based on studies of people in isolation, or merely as units of a statistical aggregate, had left something out of the picture.

It had become obvious that the influences of mass media are not only paralleled by the influence of people; in addition, influences from the mass media are, so to say, refracted by the personal environment of the ultimate consumer. Whether one person influenced another did not depend only upon the relation between the two, but also upon the manner in which they were imbedded into circles of friends, relatives, or co-workers.

The authors thus undertook to examine the growing literature of small group research whose insights had clearly become relevant to their findings. They found that group dynamics had paid no more attention to problems of media influence than students of mass communications had to the interpersonal and situational variables in "effects" formation.

It therefore seemed that, as a natural and necessary complement to our study, we should attempt a systematic integration of the two developments which had grown rapidly and simultaneously, but which had not taken account of each other: Small group research on the one hand, and the study of mass media and personal influence through broad-scale survey techniques, on the other.

The first part of the book forms the beginning of such a systematic integration. Its significance is pointed up in its subtitle, "A New Focus for the Study of Mass Media Effects."

If one begins to interpret mass communication research with the thesis in mind that people's opinions, attitudes, communication-relaying functions are rooted in the social spheres in which they live, work, and feel at home, findings indeed appear in a new and powerful focus. The focus throughout is on the research implications of taking into account the *shared character* of communication influence.

Patterns of communication *within* groups thus come to have obvious implications for a discussion of communication *to* the group. Between mass media and "effects en masse" lie persons' specific relatedness to each other, shared norms, group functions and beliefs instrumental to social cohesion, interpersonal networks affecting exposure, impact, influence, and the availability (or lack of availability) of institutional mechanisms (like buying in stores vs. "fighting juvenile delinquency") through which people can express measurable real-life "effects."

Armed with these considerations through a richly rewarding and readable discussion of much pertinent literature, the reader

will follow, in Part II, the now understandably meandering paths of the flow of everyday influence in a middle-sized Midwestern city, Decatur, Illinois. In an original cross-sectional sample of some 800 women, "influentials" and "influenced" were located by using the criterion of giving (and accepting) advice resulting in opinion change in the four areas of marketing, fashion, movie selection, and public affairs. The relative frequencies of exposure, impact, and effectiveness of personal and media contacts were compared in each area. The flow of influence in each was also related to three personal "dimensions" of influentials and influencees: life cycle, socio-economic status, and gregariousness. From these cross-comparisons emerges a complex pattern of the profiles of opinion leaders, the structure of concentrations of leaders, the web of vertical influence from the media and among the groups, and of horizontal influence within the groups themselves.

It might occur to readers of this journal, that a further "integration" of the relevant insights of audio-visual education research with those of small group and mass media influence studies might have been rewarding. That this did not appear so (or occur) to the authors might stem from the still insular nature of the two fields in regards to one another (an insularity that this journal is helping to bridge). This omission, however, does not diminish the significance of the present work *to* educational research and practice.

We have convincing evidence here to indicate that the mechanical and atomistic inference of simple causal relationships between presumed content and randomly observed "effects" is technocratic ritual rather than social science, whether in the field of "mass" or classroom communication. We can no longer assume (if we ever have) that expert content, even when tuned to audience or student predispositions *in general,* will lead to predictable influence or learning *regardless of the concrete social situation in which and for which it is used.* Nor can we continue to separate "group dynamics" from, for example, lecture or film presentation, and assume that the former applies only to discussion or "participation" situations, while the latter achieve decisive influence upon amorphous masses or classes.

The only "mass" in mass communication is the commodity nature of its products, that is, its system of *production* and *distribution.* The pressures of the mass market, and its pragmatic effectiveness on the cash register, appeared to remake its consumers in its own image. The term "mass," with its implications of stereotyped aggregation to be manipulated, shifted from pro-

duction to include its present association with *man* and *society*. One historical corollary of this conceptual shift was the imposition of certain theoretical limitations on the scope and depth of research efforts, and the slighting of the differential, creative role of social and institutional relations in the communication process.

It is to be hoped that the growing concern with the users and uses of popular culture content will transcend the present limitations upon the conceptual scope of large-scale investigations. These limitations are imposed by a market orientation preoccupied with influencing consumers to consume, and conceiving of ultimate effects in terms of the binary notation: sale—no sale. The "rediscovered" concern with people promises to broaden and deepen research preoccupations to include human uses, transformations, and consequences of mass-produced cultural commodity content, and examination of the social ends they serve.

The seeds of this promise are inherent in the approach of the present work. Some next steps in the "foundations of communication research" are indicated by the acknowledged limitations still apparent in the scope of the field study.

The "flow of influence," and, also, of relevant meanings of mass media content, need to be traced beyond the influential-influenced exposure and impact framework. A fuller picture of this "flow" as a continuous process within and among group networks needs to be linked up with content analysis to shed more light on perceptual and functional transformations of meanings. Institutional influences (neighborhood, community, national) and long-term consequences need to be investigated. The historical dimension of social group formation along with that of mass media content formation need to be brought into some relationship in which the influence of mass communication upon the group process itself, and vice versa, can be appraised. The mutuality of implicit assumptions imbedded in media content on the one hand, and group norms and values tacitly held on the other, needs scrutiny.

All these involve a monumental task. But, as Mills suggested, few problems are so central to understanding man's consciousness of his existence as the problem of communication. The task for the physical geography and social anatomy of communication is to portray its subject matter so that enriched consciousness may direct the changing facts of existence toward their human ends. Some auspicious beginnings have been made. In its broader implications, this volume can be considered a milestone.

CARPENTER, C. R.; GREENHILL, L. P.; McINTYRE, C. J.; SHERK, H. D.; SMITH, G. W.; and WATKINS, R. W. *An Investigation of Closed Circuit Television for Teaching University Courses.* State College, Pennsylvania: The Pennsylvania State University, 1955.

Reviewed by
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This extensive study is an important contribution to an area of television utilization marked by a paucity of information. It will be welcomed by those who are faced with the question of the role of television in university teaching. With characteristic energy, both in the present study and subsequent activities, the Penn State investigators have approached a variety of television problems on a broad front.

The study was oriented within the framework of interests specified by the Fund for the Advancement of Education which provided financial support. Essentially, this interest lay in developing the potential of television for alleviating instructor shortages through increasing the availability of good instructors to larger groups of students. Further, it was specified that television developments for university application must be characterized by feasibility for university teaching and acceptability to the personnel of such institutions. Fund officials were not immediately interested in research or instructional improvement. "What was wanted was a realistic demonstration using selected courses *taught as usual* for an *entire semester* over closed circuit television."

In evaluating the study, I think one should divide it into two aspects. The first is related to the descriptive experiences with equipment, production procedures, and student and faculty reactions. As a guide to beleaguered university administrators considering the use of television, the report offers a wealth of detailed information, if not, at all times, encouragement. The most pleasing feature of the Penn State group's approach is their willingness to explore and try out any number of methods. This is an orientation well suited to the present development stage of television, particularly in the university setting, where building up a fund of experience and developing guidelines are necessary.

Vidicon equipment was employed in the study and its use expanded in current television applications at Penn State. This

equipment is widely used for educational television and an important attraction is its lower cost and portability as compared to image orthicon equipment. In the past, working with both types of equipment, I have tended to favor the use of image orthicon if only because of greater reliability and lower maintenance requirements. However, with the rapid engineering improvements in vidicon manufacture, this factor should be equated for both types of equipment. On the other hand, there are in production transistorized image-orthicon equipment which is lighter than their current vidicon counterparts. Combined with the image-orthicon's capability for working under less critical lighting conditions (such as might be found in the university classroom) and its better resolution, there is room for decision as to which type of equipment is best suited for university needs.

Exception can be taken to some of the comparative statements made on page 24 of the report. Having worked with both vidicon and image orthicon equipment, I have not found that less skill was required for vidicon. A cameraman who can handle vidicon cameras well or a technician who has maintained vidicon equipment can make the transition to image-orthicon equipment without difficulty. The report refers to the large amount of maintenance required of their equipment. I would venture to guess that the personnel who worked on these 1954 vidicon equipment would find image-orthicon maintenance within their capabilities. Since the present study used vidicon equipment only, I feel that this judgment and some of the others should reflect a comparative use of both types of equipment under similar use conditions.

The other aspect of the report describes the results of comparisons in teaching effectiveness between television and classroom instruction for a number of courses. A critical examination of the methodology employed in making these comparisons would extend well beyond the scope of this review. The report itself frequently alludes to various deficiencies in the design and execution of this part of the study. Perhaps the most important deficiency was failure to control for outside sources of information such as textbook reading. To these may be added the use of tests based on textbook materials and lack of control of instructional conduct. I would venture to guess that a major portion of what was measured by the tests lay outside the confines of the study and was not controlled by the investigators.

The investigators could justifiably maintain that the study represented the conditions under which television is used in a university setting and that their results describe what is found

under these applied conditions. For practical purposes, the students appeared to have learned equally well with television instruction and it really doesn't matter whether such factors as outside textbook readings were the main contributory learning factor. If the tests of achievement used are considered satisfactory, then I think the study's results are quite acceptable within the applied framework of the project. I do find objectionable, however, the comparisons of the results of this study with other studies where better design or stricter controls were observed and which were more critically oriented to obtaining unobscured comparative learning effects. In this instance, you cannot have it both ways. The investigators are in a position of strength when they take the view that they have measured teaching effectiveness resulting from an ongoing instructional situation where such factors of textbook reading, instructor differences or bias prevail and are not ordinarily controlled. But in making comparisons with other studies where such effects were controlled, they invite serious methodological criticisms. It is possible for two or more studies to arrive at grossly similar conclusions. Such results, however, do not lead to the conclusion that the studies were equally rigorous in design and execution. From this viewpoint, the present study is not, in my opinion, comparable to other studies in this area.

Just a word on the format of the report. It was evidently written in haste, and the reader will have a difficult time in getting a complete picture of particular phases of the study. For example, there is a chapter on methods and procedures. But a section on special adaptations (p. 38), appearing in a chapter devoted mainly to technical equipment problems, contains such information as ". . . When actual colors of materials were considered to be of crucial importance, samples in test tubes were circulated both in the face-to-face classes and television classes," ". . . Generally films to be used in psychology classes were tested out ahead of time." We learn for the first and only time that films were used in some of the instruction. It would seem that such information should appear in the chapter on methods and procedures.

In summary, I believe the present study provides information of value at a time when the role of television in the university is in a developmental state. While I have taken exception to some of the statements made concerning comparative equipment features, vidicon equipment does have advantages, particularly in cost, and are the major type of facility used for high school and university teaching. The comparative study results should be regarded as measurements of an uncontrolled on-going teaching situation

rather than the effects of controlled television or classroom instructional methods. The vigorous approach of the Penn State investigators and the recent description of their current and planned activities should contribute to the expanded use of television at other institutions as well.

The following rejoinder to Kanner's review (above) contains the authors' reactions, and their supplementary comments.

POINT COUNTER-POINT

C. R. CARPENTER and L. P. GREENHILL

It may be interesting and helpful to the reader to have the authors' reactions and some supplementary information concerning Dr. Kanner's excellent review of the Penn State Instructional Television Report Number One.

1. The Project is continuing, has been greatly expanded in scope and a wide range of problems are now being investigated. The research continues in a realistic academic situation where the "chips are down."

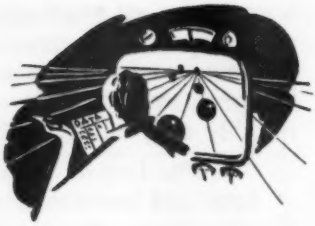
2. We are not strictly and operationally comparing vidicon and image orthicon equipment. It was our intention to present frankly the facts about the type of equipment used. It is not an objective of the Project to propagandize for any type of equipment. We merely attempt to evaluate its characteristics relative to the requirements or a closed-circuit instructional operation in a University context. Among other questions including cost, the "burn in" problem with image orthicon cameras when operated by students in instructional situations deserves careful consideration. Finally, we use three levels of television equipment of varying complexity as required by several types of instruction. We do not believe this graduation of equipment is available except with vidicon cameras.

3. The problem of limiting and channeling most of the information through the TV medium is a serious one. This year we have removed the textbook in one experimental comparison involving about 600 students. This step, which is somewhat unusual and difficult to achieve in the context of a University course, should provide interesting results.

4. Admittedly paper-pencil and verbal-abstract tests are not completely satisfactory. We are constantly working to improve our measuring instruments and inviting all the help and advice that we can get. We know of no one who has completely solved the problem of measuring academic achievement accurately, fully, reliably and validly. All measures are approximations.

5. The Report Number One was written under great pressure of time and contained contributions from several people. Report Number Two will also be written under considerable pressure and by a team of authors. We shall try to improve the format, style and general quality of the report to make it of maximum value to its readers.

RESEARCH ABSTRACTS



FILM

CARPENTER, C. R. and **GREENHILL, L. P.** *"Instructional Film Research Reports, Volume II.* Technical Report 269-7-61, NAVEXOS P-1543 Research by the Instructional Film Research Program, Pennsylvania State University for the U. S. Naval Training Device Center, Office of Naval Research, Port Washington, L. I., New York. June 1956.

Purpose: To bring together 29 research reports and to integrate and summarize the results with those of Volume I.

Procedure: Each research report was analyzed to discover the essential research result and these were integrated with the findings reported in Volume I. In addition to being classified according to their use by the curriculum planner, film planner and producer, instructor and the student a new classification was made for results of interest to the research worker.

Results: The following is a summary of research results of the complete series of film research reports. It is followed by a list of reports included in this volume. (Volume I results are summarized in the AUDIO-VISUAL COMMUNICATION REVIEW, Fall 1955 Vol. 3, No. 4.)

FOR THE CURRICULUM PLANNER

1. *Effectiveness.* Films are at least as effective as other comparable means of instruction (269-7-13, -25). Films alone can be used to teach factual information (-13, -19, -54). They can be used to teach foreign vocabulary (-53).
2. *Motor-skills.* Motor-skills that are at least as complex as operating a sound motion picture projector or performing gymnastic skills can be taught by means of films alone (269-7-11, -17, -26, -29, -39, -44). An instructor can increase his effectiveness by using film loops to teach a skill to groups while he devotes his time to coaching individuals (-25). Daylight viewing of films is very effective. Optimum viewing occurs within twelve screen widths and thirty degrees from the center line (-37).
3. *Mental Hygiene.* In addition to being effective for teaching skills and factual information suitable films can be used to improve personal adjustment (269-7-22, -46, -47).
4. *Specific Films.* Specific content in films is required to meet specific instructional objectives. Films with broad superficial content aimed at a generalized audience are likely to be less effective than films with well specified content aimed at an audience of known characteristics (269-7-19, -31, -101, -102).

5. *Specific Audience.* Films should be prepared for a specific audience (269-7-31, -44, -48).
6. *Purposeful Use.* Use films to teach. Films are likely to be more effective if they are integrated into the curriculum, and if they are related to carefully formulated instructional objectives (269-7-31, -54).
7. *Consistent Use.* People learn to learn from films (269-7-20). When films are used as fill-in, for entertainment, or if the content does not appear to the trainee to be pertinent to the course being studied, there is likely to be less learning than would otherwise be the case (-24, -54).
8. *Evaluation.* Films should be evaluated using a film analysis form (269-7-57).
9. *Dramatic Films.* A straightforward expository or documentary approach in films will be as effective or more effective for teaching information than a film that incorporates dramatized sequences especially if these are elaborately staged (269-7-50, -51, -52, -55).
10. *Perceived Usefulness.* Films that are perceived by students to contain useful material will provide the greatest amount of learning (269-7-54).
11. *Attitude Changes.* A carefully prepared film may change an attitude (269-7-60).
12. *Inexpensive Films.* Films can be prepared locally in a few weeks by nonprofessional personnel for less than $100 a reel (269-7-48).

FOR THE FILM PLANNER AND PRODUCER

1. *Camera Angle.* Show a performance on the screen the way the learner would see it if he were doing the job himself (269-7-5, -44).
2. *Rate of Development.* The rate of development of a film should be slow enough to permit the learner to grasp the material as it is shown (269-7-17, -39).
3. *Succinct Treatment.* Presenting only the bare essentials or rapid coverage of subject matter may be very ineffective (269-7-11).
4. *Show Errors.* Learning performance skills from films will be increased if you show common errors and how to avoid them (269-7-17, -25).
5. *Repetition.* Organize a film so that important sequences or concepts are repeated (269-7-17, -39, -45). Repetition of films, or parts within a film, is one of the most effective means for increasing learning to a required level (269-7-12).
6. *Organizational Outline.* Films which treat discrete factual material appear to be improved by the use of an organizational outline in titles and commentary (269-7-33).
7. *Introductions.* Present relevant information in the introduction and tell the viewer what he is expected to learn from the film (269-7-8).
8. *Summary.* Summarize the important points in the film in a clear, concise manner. Summaries probably do not significantly improve learning unless they are complete enough to serve as a repetition and review (269-7-8, -16).
9. *Visual Potentialities.* Take advantage of the ability of the motion picture medium to show motion, to speed up and slow down motion, to telescope and otherwise control timing of events and processes, to bridge space, and to organize events and actions (269-7-19, -31). The visuals and commentary in a film should reinforce each other (-18).
10. *Picture-Commentary Relationship.* The commentary of a typical informational film appears to teach more than only the pictures of that same film when learning is measured by verbal tests (269-7-18). This does not nec-

essarily mean that the commentary has greater inherent effectiveness than pictures; it may mean that producers are currently relying more heavily on commentary than on pictures or on the optimum integration of the two. With films designed to teach performance skills, where learning is measured by nonverbal tests, the pictures appear to carry the main teaching burden (-4, -49).

11. *Concentration of Ideas.* Ideas or concepts should be presented at a rate appropriate to the ability of the audience to comprehend them (269-7-7).
12. *Commentary.* The number of words (per minute of film) in the commentary has a definite effect on learning. Care should be taken not to "pack" the sound track (269-7-4, -11, -17). Application of readability formulas to improve a commentary may not do so. (-43).
13. *Use of Personal Pronouns.* Use direct forms of address (imperative or second person) in film commentaries. Avoid the passive voice (269-7-4).
14. *Nomenclature.* Introduction of new names or technical terms in a film imposes an additional teaching burden on learners, and may impede the learning of a performance skill (269-7-11, -17).
15. *Special Effects.* Special effects used as attention getting devices have no positive influence on learning (269-7-9, -51).
16. *Optical Effects.* A film in which such optical effects as fades, wipes, and dissolves have been replaced by straight cuts, teaches just as effectively as a film which uses these effects (269-7-34).
17. *Stereoscopic Films.* In the one experiment conducted, the addition of stereoscopic vision did not increase learning of a motor-skill performance (269-7-32). For teaching a complex motor-skill a three-dimensional model may be better than a two-dimensional aid (269-7-102).
18. *Color.* Experimentation has not yet demonstrated any general over-all increased learning as a result of using color in instructional films (269-7-28).
19. *Music.* Preliminary experimentation suggests that music does not add to the instructional effectiveness of an informational film (269-7-19).
20. *Pretesting.* Scripts, workprints, demonstrations and final prints can be evaluated quickly using the learning profile method of film evaluation which requires a group of trainees to estimate their own learning (269-7-23, -38, -55). A film analysis form should be used for preproduction evaluation of films (-57). Audience reactions to films can be economically obtained using infrared photography (-56).
21. *Film Loops.* Short film loops which can be repeated continuously as many times as desired, appear to be a good way of teaching difficult skills (269-7-25, -26, -27).
22. *Participation.* Learning will increase if the viewer practices a skill while it is presented on the screen, provided the film develops slowly enough, or provided periods of time are allowed which permit the learner to practice without missing new material shown on the screen (269-7-11, -39, -44, -45).
23. *Dramatic Sequences.* Incorporation of dramatic sequences such as comedy, singing commercials, or elaborately staged settings in films to teach factual information will not improve the film (269-7-50, -51, -52, -55).
24. *Filmographs.* Filmographs which incorporate still shots rather than motion may be equally effective for some purposes and be less expensive than motion pictures (269-7-51, -53.)
25. *Visual Recordings.* Films may be produced to make a visual recording of a task that may be difficult to describe with words alone (269-7-41).
26. *Research Findings.* Research findings should be applied to training film production (269-7-44).

27. *Inexpensive Films.* Because color, optical effects and dramatic effects have little to do with increasing learning from films it is possible to eliminate them. Films prepared in this manner can be made inexpensively and can be produced quickly (269-7-41, -48, -56).
28. *Protagonist.* In a film intended to change attitudes it is desirable to characterize the protagonist or commentator clearly. It is even more important that he be a prestige figure close to the audience's reference group (269-7-60).

FOR THE INSTRUCTOR

1. *Let the Film Do the Instruction.* Good films can be used as the sole means for teaching some kinds of factual material and performance skills. Where the instructional situation makes it advisable, take advantage of this possibility (269-7-13, -17, -26, -29).
2. *Instruct Students to Learn From Films.* Tell the viewers firmly, that they are expected to learn from the film, and if possible, tell them that they will be tested and do so (269-7-24, -54). This procedure will result in increased learning.
3. *Increase the Amount of Learning.* Learning can be increased by repetitive showings (269-7-12, -16, -45), pretesting (-35, -55), post-testing with knowledge of results (-30), and introducing the film and stating the purpose and importance of the showing (-24).
4. *Use of Study Guides.* Ability to learn from films improves with practice in learning from films (269-7-20). Trainees will learn more if printed study guides are used before and after film viewing (-13).
5. *Distractions.* Note-taking should not be encouraged during the average film showing because it interferes with attention and hence learning (269-7-21).
6. *Use Film Loops in the Practice Area.* One showing of a film dealing with a complex skill may be insufficient (269-7-29). Show a film in the practice area so that the student can easily refer to the film model as often as necessary. This can be accomplished by rear projection of film loops on daylight screens in the work area (-25, -26, -27, -37, -39). Students should sit within 12 screen widths and within thirty degrees of the center line (-37).
7. *Use Mental Practice.* Men can partially learn to do a skill by watching a film and imagining that they are performing the skill and by going through the skill "mentally," even though they do not have the equipment available (269-7-27). Films can provide a model for guided "mental" practice.
8. *Length of Film Sessions.* Film viewing sessions of informational material can extend to at least one hour without reduction in training effectiveness (269-7-3).
9. *Evaluate Film Showings.* Do not assume that learning has occurred as a result of showing a film. Evaluate the effect of a film by giving a test (269-7-30, -31, -49).
10. *Principles.* Explain principles of operation when it may be necessary for a trainee to generalize his learning to a different but related situation (269-7-102).

FOR THE STUDENT

1. *Learn From Films Alone.* You can learn from films alone (269-7-13), and the more films you see, the more you learn from other films (-20).
2. *Learning Is Your Job.* Films may contain many pleasant devices that might cause you to forget their serious instructional purposes. Films are being used to train you and you are expected to learn from them (269-7-9, -23, -24).
3. *Discover the Instructional Purpose.* If it is not clear to you, ask your instructor what the purpose is of the film showing, and how the material relates to your training (269-7-31, -54).
4. *Nomenclature.* Ask your instructor which names of parts must be learned (269-7-11, -21).
5. *Make Certain You Are Learning.* You will know when you are learning (269-7-23). If you do not think you are learning call this to your instructor's attention (-25).
6. *Watch for Outlines.* Outlines or titles organize a film presentation and indicate how the various topics are related (269-7-33). It will help you to learn if you will look for and study them carefully.
7. *Concentrate on the Sound.* The sound track often points out the important material to be learned in an informational film (269-7-18, -43).
8. *Mentally Practice.* Imagine that you are doing the job, or mentally imitate the operations when you are learning from a skill training film (269-7-27).
9. *Ask for a Re-showing.* If you didn't learn the first time, ask for a repeated showing (269-7-12, -45).
10. *Note-taking.* You may miss something if you try to take notes during a film. Don't take notes unless you have plenty of time and will review them (269-7-21).
11. *Ask for Test Results.* If you are tested on film content, ask to have the correct answers to the questions explained to you after the test so that you can improve your learning (269-7-30).
12. *Daylight Viewing.* When viewing skill training films under daylight conditions sit within thirty degrees of the center line and within twelve screen widths of the screen (269-7-37).

FOR THE RESEARCH WORKER

1. *Bibliography.* An extensive bibliography has been prepared of production, utilization and research on instructional films (269-7-1, -2, -19, -40, -61).
2. *Film Analysis Form.* A film analysis form based on research findings has been developed for use by a trained panel (269-7-57).
3. *Research Methodology.* Before conducting film research one should consider the many methods that have been developed (269-7-11, -13, -14, -19, -23, -44, -48, -49, -50, -56, -57, -59, -100).
4. *Criterion Measures.* An adequate criterion may be a performance test (269-7-5, -11, -17, -25, -29, -49, -50, -102).
5. *Comparative Effectiveness of Training Aids.* No differences were found in the training effectiveness of cutaways, mockups and transparencies used in instructional sequences (269-7-100, -101, -102, -103).
6. *Novelty.* Research results may be biased by the novelty of the research materials or experimental procedures (269-7-42, -49).

INSTRUCTIONAL FILM RESEARCH REPORTS (PENNSYLVANIA STATE UNIVERSITY)

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* Microfilm.
** Photocopy.

—L. Twyford

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